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THE NEW
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EDITORS

DANIEL COIT GILMAN, LL. D.

PRESIDENT OF JOHNS HOPKINS UNIVERSITY (1876-1901)
AFTERWARDS PRESIDENT OF THE CARNEGIE INSTITUTION OF WASHINGTON

HARRY THURSTON PECK, PH. D., L. H. D.

PROFESSOR IN COLUMBIA UNIVERSITY

FRANK MOORE COLBY, M. A.

LATE PROFESSOR OF ECONOMICS
IN NEW YORK UNIVERSITY

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KEY TO PRONUNCIATION.

<p>ā as in ale, fate. Also see ě, below. â " " senate, chaotic. Also see ě, below. â " " glare, care. ă " " am, at. â " " arm, father. à " " ant, and final <i>a</i> in America, armada, etc. In rapid speech this vowel readily becomes more or less obscured and like the neutral vowel or a short <i>u</i> (ū). a " " final, regal, where it is of a neutral or obscure quality. a " " all, fall. ē " " eve. ē " " elate, evade. ē " " end, pet. The characters ě, ā, and â are used for <i>ē</i> in German, as in Gärtner, Gräfe, Hähnel, to the values of which they are the nearest English vowel sounds. The sound of Swedish <i>ä</i> is also indicated by ě. ē " " fern, her, and as <i>i</i> in sir. Also for <i>ō</i>, <i>oe</i>, in German, as in Göthe, Goethe, Ortel, Oertel, and for <i>eu</i> and <i>ou</i> in French, as in Neufchâtel, Crèveœur; to which it is the nearest English vowel sound. e " " agency, judgment, where it is of a neutral or obscure quality. ī " " ice, quiet. ī " " quiescent. ī " " ill, fit. ī " " old, sober. ō " " obey, sobriety. ō " " orb, nor. ǒ " " odd, forest, not. o " " atom, carol, where it has a neutral or obscure quality. oi " " oil, boil, and for <i>eu</i> in German, as in Feuerbach. oo " " food, fool, and as <i>u</i> in rude, rule. ou " " house, mouse. ū " " use, mule. ū " " unite. ū " " eut, but. u " " full, put, or as <i>oo</i> in foot, book. Also for <i>ü</i> in German, as in München, Müller, and <i>u</i> in French, as in Buchez, Budé; to which it is the nearest English vowel sound. û " " urn, burn. y " " yet, yield. n " " the Spanish Habana, Cordoba, where it is like a <i>r</i> made with the lips alone, instead of with the teeth and lips. ch " " chair, cheese.</p>	<p>d as in the Spanish Almodovar, pulgada, where it is nearly like <i>th</i> in English then, this. g " " go, get. G " " the German Landtag, and <i>ch</i> in Feuerbach, buch; where it is a guttural sound made with the back part of the tongue raised toward the soft palate, as in the sound made in clearing the throat. H as <i>j</i> in the Spanish Jijona, <i>g</i> in the Spanish gila; where it is a fricative somewhat resembling the sound of <i>h</i> in English hue or <i>y</i> in yet, but stronger. hw " " <i>wh</i> in which. K " " <i>ch</i> in the German ich, Albrecht, and <i>g</i> in the German Arensburg, Mecklenburg; where it is a fricative sound made between the tongue and the hard palate toward which the tongue is raised. It resembles the sound of <i>h</i> in hue, or <i>y</i> in yet; or the sound made by beginning to pronounce a <i>k</i>, but not completing the stoppage of the breath. The character <i>k</i> is also used to indicate the rough aspirates or fricatives of some of the Oriental languages, as of <i>kh</i> in the word Khan. n as in sinker, longer. ng " " sing, long. N " " the French bon, Bourbon, and <i>m</i> in the French Etampes; where it is equivalent to a nasalizing of the preceding vowel. This effect is approximately produced by attempting to pronounce 'onion' without touching the tip of the tongue to the roof of the mouth. The corresponding nasal of Portuguese is also indicated by <i>N</i>, as in the case of São Antão. sh " " shine, shut. th " " thrust, thin. TH " " then, this. zh as <i>z</i> in azure, and <i>s</i> in pleasure. An apostrophe ['] is sometimes used to denote a glide or neutral connecting vowel, as in tá'b'l (table), kǎz'm (chasm). Otherwise than as noted above, the letters used in the respellings for pronunciation are to receive their ordinary English sounds. When the pronunciation is sufficiently shown by indicating the accented syllables, this is done without respelling; as in the case of very common English words, and words which are so spelled as to insure their correct pronunciation if they are correctly accented. See the article on PRONUNCIATION.</p>
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A PARTIAL LIST OF THE LEADING ARTICLES IN VOLUME V.

- CLAY. Professor Heinrich Ries.
- CLAY, HENRY. Professor William Peterfield Trent.
- CLIMATE. Professor Cleveland Abbe.
- CLUB. Mr. E. S. Nadal and Professor Francis M. Burdick.
- COAL. Professor Heinrich Ries and others.
- COAL TAR COLORS. Professor Morris Loeb.
- COAST ARTILLERY. Captain Leroy S. Lyon.
- CODE. Professor Munroe Smith.
- COFFEE. Dr. Alfred Charles True.
- COLLEGES, AMERICAN. Professor Paul Monroe.
- COLOR IN PLANTS. Professor John Merle Coulter.
- COLOR PHOTOGRAPHY. Professor Joseph Sweetman Ames.
- COLOSSIANS, EPISTLE TO THE. Professor Melancthon W. Jacobus.
- COLUMBUS. Mr. George Parker Winship.
- COLUMN. Professor Arthur L. Frothingham.
- COMET. Professor Harold Jacoby.
- COMMERCE. Dr. Roland P. Falkner.
- COMMUNISM. Professor Samuel McCune Lindsay.
- COMPASS. Lieutenant Lewis Sayre Van Duzer.
- CONGREGATIONALISM. Dr. Williston Walker.
- CONGRESS. Professor George W. Kirchwey.
- CONSTANTS OF NATURE. Professor W. J. A. Bliss.
- COOKERY. Mrs. Sarah Tyson Rorer.
- CO-OPERATION. Professor Samuel McCune Lindsay.
- CO-ORDINATE. Professor David Eugene Smith.
- CORNEILLE. Dr. Benjamin W. Wells.
- CORPORATION. Professor Munroe Smith and Dr. Harlan F. Stone.
- COSMOGONY. Professor Harold Jacoby and Professor A. V. W. Jackson.
- COSTUME. Mr. Russell Sturgis.
- COTTON. Dr. Alfred Charles True and others.
- COURT. Professor Munroe Smith and Professor Francis M. Burdick.
- COURTS, MILITARY. Colonel Edward Hunter.
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- CREMATION. Mr. Moses Nelson Baker.
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- CROMWELL. Professor George E. Howard.
- CROSS-FERTILIZATION. Professor Alpheus Spring Packard.
- CRUSADE. Professor Dana C. Munro.
- CRUSTACEA. Professor Hubert Lyman Clark and Mr. Ernest Ingersoll.
- CRYSTALLOGRAPHY. Professor William H. Hobbs.
- CUBAN LITERATURE. Professor J. D. M. Ford.
- CURVE. Professor David Eugene Smith.
- DAIRYING. Dr. Alfred Charles True.
- DAMS AND RESERVOIRS. Mr. Moses Nelson Baker.
- DANISH LANGUAGE AND LITERATURE. Professor Daniel K. Dodge and Dr. Benjamin W. Wells.
- DANTE. Dr. Frederic Taber Cooper.
- DANTON. Professor Edwin A. Start and others.
- DARWIN. Professor Charles B. Davenport and Mr. Ernest Ingersoll.

THE NEW INTERNATIONAL ENCYCLOPÆDIA

CLASSIS (Lat., assembly). In the Reformed Church of Holland and America, the name of an ecclesiastical body, made up of ministers and elders representative of churches, corresponding to a presbytery. The Classis hears appeals from the consistories, which are the official boards of local churches, and the Synod hears appeals from the Classis. The Classis also confirms and dissolves pastoral connections, ordains and deposes ministers, and sends delegates to the local and general synods. See REFORMED CHURCH IN AMERICA, THE.

CLAS'TIC ROCKS (Fr. *elastique*, from Gk. *κλαστός*, *klastos*, broken, from *κλάν*, *klan*, to break), or FRAGMENTAL ROCKS. A petrographic division which includes all rocks composed of fragmental materials. See EOLIAN ACCUMULATIONS; AQUEOUS ROCKS; BRECCIA.

CLAT'SOP. An Amerind tribe of the Chinookan stock. See CHINOOK.

CLAUDE, klôd, JEAN (1619-87). A French Protestant preacher and controversialist. He was born at La Sauvetat-du-Droît, southwest France (ancient District of Agenais). He studied at Montauban, became pastor at Nîmes in 1654, and was also professor of theology in the Protestant college there, where in 1661 he was forbidden to preach, on account of his opposition to the proposed union with the Roman Catholics. In the next year he obtained a post at Montauban, but was removed from it also. He then went to Paris, and was pastor at Charenton from 1666 until 1685. On the revocation of the Edict of Nantes (1685), he was ordered to leave France within twenty-four hours, and being welcomed by William of Orange, preached at The Hague until his death, January 13, 1687. He was the greatest leader of the French Reformed churches, their ablest disputant, their favorite preacher, and their truest representative. He is especially notable for the polemic he carried on against the school of Port-Royal. His works include: *A Defense of the Reformation* (1671, English translation, 1815), written in reply to an attack on the Calvinistic faith by Pierre Nicole, the celebrated Jansenist writer; *Complaints and Cruel Prosecutions of the Protestants* (1686; English translation, 1707); and especially, as more familiar to English readers, *Essay on the Composition of a Sermon* (1778-79, 2

vois.)—a much-used manual of homiletics, frequently reprinted, from the edition of Charles Siméon. His son published *Œuvres posthumes de Jean Claude* (5 vols., Amsterdam, 1688). Consult Ladevèze (Amsterdam, 1687).

CLAUDE LORRAINE, klôd lôr'rân'. See GELÉE, CLAUDE.

CLAU'DIA GENS (Lat., Claudian family). A patrician and plebeian clan in Rome, of Sabine origin. The patrician family names, always distinguished for their arrogance and pride, are Cæcus, Candæx, Centho, Crassus, Pulcher, Regillensis, and Sabinus. The plebeian names are Asellus, Canina, Centumalus, Cicero, Flamen, and Marcellus. Consult Mommsen, "Die patricischen Claudier," in *Römische Forschungen*, vol. ii. (Berlin, 1865). See APPIUS CLAUDIUS CRASSUS.

CLAU'DIAN HARBOR. A harbor at the mouth of the Tiber, two miles west of Ostia, constructed in the face of great natural difficulties by the Emperor Claudius. Its area exceeded 6,000,000 square feet with a depth of 15 feet to 18 feet, and was inclosed by two jetties 2400 feet long. The massive breakwater was constructed by filling with concrete the great ship which had transported the Vatican obelisk from Egypt, sinking her, and from this foundation building above the level of the water. On the breakwater rose a lighthouse 200 feet high, built in imitation of the Pharos of Alexandria. In time the Claudian harbor became inadequate to the needs of the city and an inner harbor was constructed by Trajan, now two miles inland. The Claudian harbor, which is now inaccessible on account of the marshes, is depicted on a bas-relief discovered in 1863.

CLAU'DIA'NUS, CLAUDIUS. A Latin poet who lived in the end of the fourth and the beginning of the fifth century, born at Alexandria. He came to Rome in the year 395 and there secured the patronage of Stilicho and, through him, of the Emperor Honorius. For the great Vandal leader the poet entertained a love and admiration which is voiced in a number of his minor poems. He wrote first in Greek, which appears to have been his native tongue (though he was originally of Roman extraction); but, as Gibbon says, he "assumed in his mature age the familiar use and absolute command of the Latin language; soared above the heads of his

feeble contemporaries: and placed himself, after an interval of 300 years, among the poets of ancient Rome." His poems brought him into such repute that, at the request of the Senate, the emperors Arcadius and Honorius erected a statue in his honor in the Forum of Trajan. The productions of Claudianus that have come down to us consist of two epic poems—*The Rape of Proserpine*, and the incomplete *Battle of the Giants*, besides panegyrics on Honorius, idyls, epigrams, and occasional poems. Claudianus displays a brilliant fancy and rich coloring, with variety and distinctness in his pictures; but he is often deficient in taste and gracefulness. There are several manuscripts of *The Rape of Proserpine*, of which two, from the twelfth and thirteenth centuries, are in the Laurentine Library at Florence. The best editions are by Birt (Berlin, 1892) and Koeh (Leipzig, 1893). A poor English translation was executed by Hawkins (London, 1817). Consult Hodgkin, *Claudian; The Last of the Roman Poets* (London, 1875).

CLAUDIANUS MAMERTUS (?-c.474). A Christian poet and philosopher. A younger brother of Saint Mamertus, Bishop of Vienne, he was consecrated by the latter to the priesthood, and became his assistant. He systematized the liturgy, and was the author of the hymns known as the *Small Liturgies*, sometimes heard in Catholic churches during the services preceding Ascension Day. The hymns *Contra Poetas Varios* and *Punge lingua gloriosi laurcam certaminis* have also been ascribed to him. In his famous philosophical treatise, *De Statu Animæ* (published by Mosellanus, Basel, 1520, and, with notes, by C. Barth, Zwickau, 1655), he shows that "thought is inseparable from the essence of the soul, and that its spiritual activity is indestructible" (Neander, *History of Dogmas*). His complete works were edited by Engelbrecht, and published in *Corpus Scriptorum Ecclesiasticorum Latinorum*, vol. xi. (Vienna, 1885). Consult Engelbrecht, *Untersuchungen über die Sprache des Claudianus Mamertus* (ib., 1885).

CLAUDIA QUINTA. A Roman woman who disproved the charge of unchasteness brought against her, when the ship carrying the image of Cybele was brought to Rome from Pessinus in B.C. 204. The vessel grounded on a shoal at the mouth of the Tiber, and when the soothsayers declared that it could be moved only by a pure woman, Claudia came forward and, seizing the rope, towed the ship to Rome.

CLAUDIO. (1) In Shakespeare's *Much Ado About Nothing*, a young Florentine lord. He is in love with Hero; but his affection is not strong enough to prevent his believing the scandal against her. (2) In Shakespeare's *Measure for Measure*, the lover of Juliet.

CLAUDIUS. (1) In Shakespeare's *Hamlet*, the King of Denmark, who poisons his brother, Hamlet's father, and marries the widow. He is slain by Hamlet, when the Queen, by mistake, drinks the poisoned wine. (2) A servant whom Brutus accuses of calling out in his sleep, after the appearance of the ghost of Cæsar, in Shakespeare's tragedy *Julius Cæsar*.

CLAUDIUS I. (TIBERIUS CLAUDIUS NERO DRUSUS; officially TI. CLAUDIUS CÆSAR AUGUSTAVUS GERMANICUS) (B.C. 10-A.D. 54.) Roman Emperor (A.D. 41-54). He was the youngest son of Nero Claudius Drusus, stepson of the Emperor Augustus, and was born at Lugdunum

(Lyons), B.C. 10. Being naturally sickly and infirm, his education was neglected, or left to be cared for by women and freedmen. His supposed imbecility saved him from the cruelty of Caligula; but Claudius, in his privacy, had made considerable progress in the study of history, and wrote in Latin and Greek several extensive works now lost. After the assassination of Caligula, Claudius was found by the soldiers in a corner of the palace, where, in dread, he had concealed himself. The Pretorians carried him forth, proclaimed him Emperor, and compelled his recognition by the Senate and many citizens who had hoped to restore the Republic. By his payment of the troops, who had raised him to the throne, Claudius I. gave the first example of the baneful practice which subjected Rome to a military despotism under the succeeding emperors. The first acts of his reign seemed to give promise of mild and just government; but in the year 42, when a conspiracy against his life was detected, his timidity led him to yield himself entirely to the guidance of his infamous wife, Messalina, who, in concert with the freedmen Pallas and Narcissus, practiced cruelties and extortions without restraint. Claudius meanwhile lived in retirement, partly occupied in studies, and expended enormous sums in building, especially in the construction of the famous Claudian Aqueduct, Aqua Claudia. This great work occupied 30,000 laborers during 11 years. Abroad, the armies of Claudius were victorious. Mauretania was made a Roman province, the conquest of Britain was commenced under the personal command of the Emperor, and some progress was made in Germany. After the execution of Messalina, Claudius married his niece, Agrippina (q.v.), who exercised as unlimited influence over him as had his former wife. Under her inspiration he deprived his son Britannicus of the succession to the Imperial power and adopted Domitius Ahenobarbus Nero, the son of Agrippina by Gnaeus Domitius Ahenobarbus. When Claudius showed some inclination to deprive Nero of the succession Agrippina caused him to be poisoned with a dish of mushrooms. After his death, Claudius was deified, giving occasion to Seneca's bitter satire, *Apocolocyntosis*, or *Gourdification*.

CLAUDIUS II. (MARCUS AURELIUS CLAUDIUS, better known as Claudius Gothicus) (214-270), Roman Emperor (268-270). He had been Governor of Illyria, and, after the death of Gallienus, in 268, was proclaimed Emperor by the soldiers. In the same year he overthrew his rival, Aureolus, and conquered the Alemanni; in the following year he defeated a great host of Goths that menaced Mœsia, and 50,000 of them perished in battle, whence the title *Gothicus*. Claudius died of the pest, at Sirmium, April, 270.

CLAUDIUS, ARCH OF. A triumphal arch at Rome, erected in A.D. 43 on the Via Lata, to commemorate the victories of Claudius in Britain. It was destroyed in the seventeenth century.

CLAUDIUS, MATTHIAS (1740-1815). A German poet and author, known as 'Asmus,' or 'Der Wandsbecker Bote,' born at Reinfeld, Holstein. He studied from 1759 to 1763 at the University of Jena; from 1771 to 1775 was editor, under the name of 'Asmus,' of the newly established *Wandsbecker Bote* (whence his surnames), and in 1776 of the *Landzeitung*, at Darmstadt. In the following year he returned

to Wandsbeck, where he henceforth lived. He was appointed in 1778 auditor of the provincial bank of Altona, by the Crown Prince Frederik of Denmark, who also, in 1785, granted him a small annuity. His collected works, published in 1775-1812 (eight parts), with the quaint title *Asmus Omnia Sua Secum Portans*, were in great part taken from his contributions to the *Wandsbecker Bote*. His prose is shrewd, aphoristic, with a certain naïve humor; his verse, now buoyantly merry, now patriotic, now in the best sense religious, is always fresh, simple, and sincere. Many of his lyrics, such as *Der Mond ist aufgegangen* and the *Rheinweinlied* ('Bekränkt mit Laub'), have continued to be popular favorites throughout Germany. He also translated into German Fénelon and other writers, French and English. The collected works have been excellently edited by Redlich (12th ed., Gotha, 1882). For his biography, consult Herbst (Gotha, 1878) and Gerok (Darmstadt, 1881).

CLAUDIUS CÆCUS, APPIUS. A Roman patrician of the fourth and third centuries B.C. When censor, in B.C. 312, he gained many adherents by invading the traditional rights of the patricians, and admitting men of low birth to senatorial rank; but his nominations were quickly set aside. He is more memorable for having at the same time undertaken the construction of the great Appian Way from Rome to Capua, and also of the first aqueduct (Aqua Appia) to bring a supply of water into the city. In order to complete these works, he arbitrarily continued his censorship beyond the legal limits. He was elected consul in B.C. 307 and 296, and met with success in several campaigns against the Samnites and Etruscans. When Pyrrhus of Epirus sent Cineas to Rome with terms of peace unfavorable to Roman greatness, it was only the eloquence of the aged Claudius that prevented the Senate from accepting them. In his old age Claudius is said to have become blind, whence his cognomen, 'Cæcus.' He was the author of works in both prose and verse, of which almost nothing is known. Consult Mommsen, "Die patrieischen Claudier," in *Römische Forschungen*, vol. ii. (Berlin, 1865).

CLAUDIUS CRAS'SUS, APPIUS. See APPIUS CLAUDIUS CRASSUS.

CLAUDIUS NERO. See NERO.

CLAUDIUS OF TURIN (Lat. *Claudius Turinensis*) (?-839). A Spanish-Italian bishop. At first a preacher at the Court of Louis the Pious, he became Bishop of Turin in 820. He was one of the most radical iconoclasts of his time, and protested against the use of images, the invocation of saints, and the veneration of relics. His attitude kept him in constant controversy with Pope Paschal I. Claudius wrote an *Apologium*, directed against the Abbot Theodemir, of the Convent of Psalmody, near Nîmes. The abbot's part was taken by Dungal, an Irish scholar and teacher, who called upon the King to "crush the tail of the serpent in Claudius, as Charlemagne had so well crushed the head in his master, Felix of Urgel." Jonas of Orleans, at the request of the Emperor, also wrote against Claudius, but both Louis and Claudius died before the publication of his work.

CLAUS, KLOUS, KARL FRIEDRICH WILHELM (1835-99). A German zoölogist, born in Cassel.

He studied the natural sciences in Giessen, under Leuckart; in 1863 became professor of zoölogy in Marburg, in 1870 in Göttingen, and in 1873 in Vienna. He was also director of the zoölogical station at Triest. He was very active in the investigation of the Crustacea, and is also widely known because of his *Text-Book of Zoölogy*. Of his numerous works, the following are important: *Die freilebenden Copepoden* (1863); *Beiträge zur Kenntniss der Ostracoden* (1868); *Grundzüge der Zoölogie* (1868); *Ueber den Bau und die Entwicklung der Cumaceen* (1870); *Die Metamorphose der Squilliden* (1872); *Ueber die Entwicklung Organisation und systematische Stellung der Arguliden* (1875); *Lehrbuch der Zoölogie* (6th ed., 1897; trans. into English, under the title of *Text-Book of Zoölogy*, by Claus and Sedgwick, London, 1897).

CLAUSEL, kló'zēP, BERTRAND (1772-1842). A French marshal, born at Mirepoix, in the Department of Ariège, December 12, 1772. He entered the army at an early age, and commanded a brigade in the Italian campaign of 1799. He was made a general of division of the Army of the North, in 1804; distinguished himself in the campaign of 1809 against Austria and subsequently in the war in Spain, where, after the battle of Salamanca, July 22, 1812, he succeeded Marmont in the chief command. He conducted the very difficult retreat from Portugal, with the greatest circumspection, fighting a succession of battles. Although he stood by Napoleon to the last, Louis XVIII., in 1814, named him inspector-general of infantry. When Napoleon returned to France in 1815, Clausel immediately declared for him, was made a peer, and received the command of the Army of the Pyrenees. On the return of the Bourbons he was declared a traitor. He escaped to the United States, and lived several years at Mobile, where he wrote his *Exposé justificatif*. During his absence he was condemned to death, but was subsequently permitted to return to France, was elected Deputy in 1827 and 1830, and after the July Revolution was put in command of the troops in Algeria. For his services in that capacity he was made marshal of France in 1831, but was soon afterwards recalled. He was appointed Governor-General of Algeria in 1835, and once more recalled in 1837. He returned to France and defended himself, though not quite successfully, both through the press and from the tribune, against the attacks made upon him. He died near Toulouse, April 21, 1842. See ALGERIA.

CLAUSEN, klou'zen, THOMAS (1801-85). A German astronomer, born at Nübel, in Schleswig. He early devoted himself to the study of astronomy, was for several years assistant at the observatory of Altona, and from 1842 to 1872 was connected with the Observatory of Dorpat (now Yurjev), first in the capacity of observer, later as director. During his scientific career Clausen made many important contributions to astronomy, and carried out elaborate calculations of the paths of comets.

CLAUSENBURG, klou'zen-burg. See KLAUSENBURG.

CLAUSEWITZ, klou'ze-vits, KARL VON (1780-1831). A Prussian general and eminent military writer, born at Burg. He entered the army in 1792, took part in the campaigns on

the Rhine in 1793-94, and attended the Berlin Academy for young officers in 1801-03, when he attracted the attention and won the favor of Scharnhorst. He was adjutant to Prince Augustus in 1806, was captured with him by the French at Prenzlau, and, after being exchanged, served until 1812 as major in the Prussian General Staff, being employed after 1809 in the Ministry of War, under Scharnhorst. In 1810-12 he was also military instructor to the Crown Prince of Prussia, and to Prince Frederick of the Netherlands. At the outbreak of the Russian War in 1812, he entered the Russian service, and aided Diebitsch in concluding the convention of Taurroggen. He accompanied Blücher as Russian staff officer during the campaign of 1813, the history of which he wrote, at the instance of Gneisenau. He reentered the service of Prussia in 1814, was appointed chief of staff under Thielmann in the following year, and remained in that position at Coblenz until 1818, when he was made major-general and director of the 'Allgemeine Kriegsschule.' Finally, he was appointed, in 1831, chief of staff to Field-Marshal Gneisenau, and served first in Berlin, then on the Polish frontier. His writings are of great value, and have led to a considerable change in the theory of war. They were published after his death as *Hinterlassene Werke über Krieg und Kriegführung* (10 vols., 1832-37), of which the most noteworthy are: *Vom Kriege; Der Feldzug von 1796 in Italien; Uebersicht des Feldzuges von 1813; Der Feldzug von 1815; Ueber das Leben und den Charakter von Scharnhorst.*

CLAUSIUS, klou'zê-us. RUDOLF JULIUS EMANUEL (1822-88). A German physicist, born at Köslin. In 1855 he became professor in the Polytechnic Institute of Zurich, in 1867 professor in the University of Würzburg, and in 1869 professor at Bonn. Clausius is one of the founders of the modern science of thermodynamics (q.v.), and in a paper before the Berlin Academy of Sciences (1850) stated the second law of thermodynamics, that "heat cannot of itself pass from a colder to a hotter body." The theory of electrolysis advanced by Clausius has also played a conspicuous part in electricity. He assumed that the ions are not in complete union, but that a part of them are free to unite with other ions. These uncombined ions, accordingly, are brought together under the action of the current at the anode and cathode. Clausius was one of the most celebrated mathematical physicists of the nineteenth century, and his researches and writings in heat, electricity, and molecular physics of the greatest value. His most important works are: *Die mechanische Wärmetheorie* (1876); *Die Potentialfunktion und das Potential* (1859); and *Ueber das Wesen der Wärme, verglichen mit Licht und Schall* (1857). For a biography of Clausius, consult Riecke, *Rudolf Clausius* (Göttingen, 1889).

CLAUSON-KAAS, klou'zôn-kâs'. ADOLF VON (1826--). A Danish promoter of manual training. He was born near Altona, of Danish parents, and after serving in the Danish cavalry devoted himself entirely to the advancement of education. In 1870 he founded the Danish Clubs for Home Industry. On the occasion of the international exhibitions of 1873 and 1878, he gave a series of public lectures on manual training in several cities of Germany, Holland, Russia, France, and elsewhere, and also

established a series of teachers' courses. In this way he encouraged the revival of working-schools for boys, his primary aim being the mechanical development of the hand and of the eye in association with mental training. He conducted a number of training-schools in Saxony, and introduced a course of modeling and drawing in the institution for the blind at Dresden.

CLAUSTHAL, klous'tâl (Ger., closed valley, from Lat. *clausum*, p.p. of *cludere*, to close + Ger. *Thal*, valley). An important mining town in the Prussian Province of Hanover, situated on a bleak plateau of the Upper Harz, about 1800 feet above sea-level, and 25 miles northeast of Göttingen (Map: Prussia, D 3). Among its public buildings the most noteworthy is the Church of the Holy Ghost, built of wood in 1639, and considered the largest structure of its kind in the world. The mines of Clausthal yield silver, lead, copper, iron, and zinc, and are among the most valuable and productive in Germany. They are owned and operated by the Prussian Government, which has established in connection therewith a mining academy, with an experimental laboratory, model workshop, and a library of over 30,000 volumes. The greater portion of the male population finds employment in the mines and smelting-works, while the women are largely occupied in the knitting-mills. Population, in 1890, 8736; in 1900, 8565. Clausthal was founded by the dukes of Brunswick, in the sixteenth century.

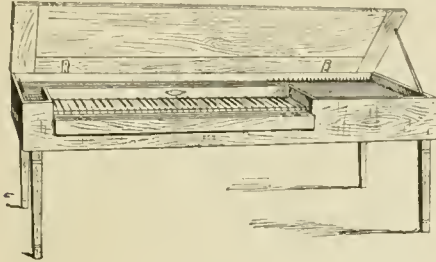
CLAVARIA (Neo-Lat. nom. pl., from Lat. *clava*, club). A genus of fungi of the division Hymenomyces, subdivision Clavati. The spores are produced equally on all parts of the surface. The species are numerous, some of them simple and club-shaped, some branched. *Clavaria botrytis*, a species common in oak and beech woods in Germany, growing on the ground among moss, grass, heath, etc., is gathered when young, and used as food, having a very agreeable sweetish taste. It ceases to be edible when it becomes old. Another German species, *Clavaria flava*, which grows on sandy ground in fir-woods, is used in the same way. Other species appear to possess similar properties, and Liebig found them to contain the saccharine substance called mannite. *Clavaria botrytis* is the *Keulenpilz*, and *Clavaria flava* the *Ziegenbart* (goat's-beard) of the Germans. See Colored Plate of EDBLE FUNGI.

CLAVERACK, kläv'-êr-ak. A town in Columbia County, N. Y., 30 miles south of Albany, on the Boston and Albany Railroad. The chief industries are agriculture and the manufacture of knit goods. The town has a public library, and is the seat of the Hudson River Institute, established in 1854. Among the points of interest are a Dutch Reformed church, built in 1767, and an old court-house, erected in 1784. Settled as early as 1660, Claverack (named Klauver Raehen, 'lover reaches,' by the Dutch) was organized as a town in 1788, and was the county-seat from 1786 to 1806. The government is administered by town meetings, held every two years. Population, in 1890, 4518; in 1900, 4416.

CLAVERHOUSE. See GRAHAM, JOHN.

CLAVICHORD, kläv'î-kôrd (Fr. *clavicorde*, Med. Lat. *clavichordium*, from Lat. *clavis*, key + *chorda*, string). An instrument of the harpsichord family, and an important step in the evo-

lution of the pianoforte. Its history previous to the fifteenth century is unknown. The clavichord was shaped like the square pianoforte, having a keyboard of white and black keys, and strings of brass wire set in vibration by the action of tangents or 'jacks' covered with metal. Its tone, though weak, was delicate, and, unlike the harpsichord, or spinet, in which the strings were plucked or twanged by quills or pieces of hard leather, it responded to the gradations of the player's touch. The clavichord was used in Germany until the beginning of the nineteenth



CLAVICHORD.

century. Bach preferred it to the pianoforte of his day, and wrote an essay for his son, *Versuch über die wahre Art Klavier zu spielen*, for this instrument. Mozart used the clavichord in composition, and Beethoven preferred it to other keyed instruments; for upon it, he said, "one could best control tone and expressive interpretation." See HARPSICHORD; SPINET.

CLAVICLE (Lat. *clavicula*, a little key, dim. of *clavis*, key), or COLLAR-BONE. A long bone, curved somewhat like the italic letter *f*, and placed at the upper and anterior part of the thorax, in a nearly horizontal position. In connection with the scapula or shoulder-blade, the clavicle forms the shoulder, and is the only bony connection between the upper extremity and the trunk. The inner extremity of the clavicle articulates with the sternum (breast-bone) and the cartilage of the first rib, while the outer extremity articulates with the scapula. The range of motion in the clavicle is extensive—especially in a vertical direction—and the various movements of the arm are in this way readily accommodated. In the female the clavicle is smoother, slender, and presents a less marked curve. The length, also, is slightly less, and the position more nearly horizontal. Manual labor, which brings the shoulder into constant exercise, renders the clavicle thicker and tougher, and therefore in right-handed people the right clavicle shows greater development.

Since the clavicle favors the lateral movements of the upper extremities, we do not find it in animals whose fore limbs are used only for progression; but it is present in almost all animals whose anterior extremities are clawed and used for prehension.

The clavicle is frequently fractured by direct violence, and also by indirect force, as in falling upon the hand. Dislocations are of less frequent occurrence.

Ossification of the clavicle begins very early—even as soon as the thirteenth day, according to Beclard—and at birth this process is almost complete. Consult: Gray. *Anatomy*, edited by Pick

(London, 1893); Holden, *Human Osteology* (New York, 1885).

CLAVIER, klä-fër' (from Lat. *clavis*, key). The German name for the pianoforte, and the prototype of the clavichord (q.v.). In French, 'clavier' designates the keyboard of an organ or pianoforte. For the practice clavier, see PIANO-FORTE.

CLAVIJERO, or **CLAVIGERO**, klä'vé-nä'rô, FRANCISCO XAVIER (1731-87). A Mexican historian, born in Vera Cruz. He early entered the Order of the Jesuits, and became a teacher of rhetoric and philosophy. He lived among the Indians in various parts of Mexico as a missionary for many years, and made himself fully acquainted with the languages, traditions, and antiquities of the aboriginal tribes. On the expulsion of the Mexican Jesuits by Spain, in 1767, he sailed for Italy, and with others of his Order settled in Bologna, where he founded an academy. He wrote, in Spanish, a work on early Mexican history; but, in order to publish it, he was obliged to translate it into Italian. The work finally appeared as *Storia antica del Messico* (1780); it is a comprehensive and valuable history of the Aztec Period. An English translation was made by Cullen (London, 1787). Clavijero also wrote *Storia della California* (1789), and works on physics and philosophy.

CLAVIGO, *Span. pron.* klä'vë'gò. A play by Goethe (1774), based on an episode in the life of José Clavijo y Fajardo, a Spanish official and journalist.

CLAVIJO, klä'vë'nô, DON. A character in *Don Quixote*, delivered by Don Quixote from the form of a crocodile, into which he had been changed by enchantment.

CLAVIJO, RUY GONZALEZ DE (? -1412). A Spanish traveler in the Orient. He was born in Madrid, and in 1398 and 1403 was sent by Henry III. of Castile as ambassador to Tamerlane. The route followed by him from his point of departure, Cadiz, took him to Trebizond, Armenia, Persia, and Khorasan. He arrived at Samarkand in 1404, and was well received at the Court of Tamerlane. After his death, his suite returned alone, after an absence of three years. The 'journal' of Clavijo was published under the title *Historia del gran Tamerlán é itinerario y narración del viaje*, etc. (1582; reprinted in 1782). It is valuable, not only because of its high literary merit, but also for its historical importance.

CLAVILEÑO, *Sp. pron.* klä'vé-lä'nyô, EL ALIGERO. The wooden horse, said to have been constructed by Merlin, which was managed by a wooden pin in its forehead; whence its name, 'the winged pin-timber.'

CLAY (AS. *clæg*, Ger. *Klei*; ultimately connected with Lat. *glus*, *gluten*, gluc, Gk. γλοῦς, *gloios*, gum, OCh. Slav. *glčnū*, slime). A term applied to earthy material or soil which shows plasticity when wet, thus permitting it to be molded into any desired form, which it retains when dry. Its distinguishing character is a physical one; for clay varies widely in other respects, being made up of fine mineral fragments, the most prominent of which may be the mineral kaolinite, a hydrated silicate of alumina. Clay is formed primarily by the decomposition of feldspathic rock *in situ*, and such a

clay is said to be residual in its nature. The material, however, is often washed down into the lakes or ocean by the surface-waters, and there spread out over the bottom as an aluminous sediment: such a clay deposit being known as a sedimentary one, which is not only stratified, but may also be more extensive than a residual. Sedimentary clay sometimes becomes consolidated by the pressure of other sediments which have been deposited on top of it, and it is then termed shale. These shales, on grinding and mixing with water, develop the same plasticity as does soft clay.

The chief chemical constituents of clay are silica and alumina; but, in addition to these, variable quantities of iron oxide, lime, magnesia, alkalies, water, and even rarer substances are often present. These ingredients affect the physical properties of the clay; such as its color when burned, air and fire shrinkage, refractoriness, plasticity, and thus indirectly its uses. The lime, magnesia, iron oxide, and alkalies exert a fluxing action in burning, and the greater their quantity the lower the fusing-point of the clay. Silica decreases the air and fire shrinkage of a clay, while alumina and water have the reverse effect. The property of plasticity, together with that of hardening under fire, makes clay an article of great value in the plastic arts. Those clays which are low in plasticity are said to be 'lean,' while the highly plastic varieties are 'fat.' Clay does not fuse suddenly, but softens gradually under the influence of heat. In very fusible clays this sintering may begin at 1500° or 1700° F., while in very refractory kinds it does not take place until a temperature of 5000° F. or more is reached. The red color of a burned clay is due to considerable iron oxide, while buff is produced by a small quantity of iron, or by an excess of lime. The following table gives the composition of several grades of clay:

	1	2	3	4	5	6
	%	%	%	%	%	%
SiO ₂	62.40	45.78	54.23	68.54	63.31	60.59
Al ₂ O ₃	26.51	36.46	32.80	18.49	16.57	12.46
TiO ₂	1.14	1.08	.21	3.38	4.06	5.79
CaO.....	.86	.50	.....	1.03	1.11	6.84
MgO.....	.01	.04	.....	.88	1.10	3.28
Alkalies.....	.10	.25	.....	2.37	3.16	4.39
H ₂ O.....	13.35	13.40	11.24	4.62	6.89	4.36
Moisture.....	.....	2.05	.....	1.52	3.76	1.46

(1) Crude kaolin, Webster, N. C.; (2) Washed kaolin, Webster, N. C.; (3) Fire-clay, Wympe's Gap, Pa.; (4) Paving brick shale, Kansas City, Mo.; (5) Brick-clay, Indianola, Iowa; (6) Calcareous slip clay, Albany, N. Y.

Clay is used in the manufacture of common, pressed, and paving brick; terra-cotta, fireproofing, terra-cotta lumber; roofing, floor, and glazed tile; firebrick, retorts, crucibles, muffles, and other refractory goods; all grades of pottery, stoves, sewer-pipe, door-knobs, electrical insulators, turbine-wheels, closets, and bathtubs and washtubs; filters, mineral paint, food-adulterants, Portland cement, paper-fillers, emery-wheels (as a cement therein), ultramarine, modeling, soap, etc.

Clay is widely distributed geographically, and also geologically—i.e. in the rock-formations of different ages. In the United States deposits are found at a great number of localities. The Cretaceous clays of New Jersey are much used in the manufacture of refractory goods and white-

ware, while the Carboniferous clays of Pennsylvania and Ohio are also extensively employed for making firebrick. Kaolin is quarried at several points in North Carolina, Georgia, Maryland, and Wisconsin; much white ball-clay is found in Florida, and stoneware-clay in Illinois and Missouri. Clays suitable for brick, terra-cotta, and sewer-pipe occur at many points all over the United States. In the Central States, clays suitable for the manufacture of vitrified paving-brick are actively worked. With all this supply, however, much ball-clay and kaolin is imported, the material coming chiefly from England. About \$70,000,000 worth of clay products are produced annually in the United States alone.

The different varieties of clay are as follows: KAOLIN (q.v.) or CHINA-CLAY. A very white burning clay, used in the manufacture of porcelain and white earthenware. It is of residual origin, and often occurs in the form of veins.

FIRE-CLAYS (q.v.). Clays containing a low percentage of fluxes, and hence capable of resisting high temperatures. They are used in the manufacture of all classes of refractory goods, and sometimes also for making pressed brick and terra-cotta.

FLINT-CLAY. A dense, hard, non-plastic fire-clay, often found in the Carboniferous formations.

PIPE-CLAY. A term applied to many smooth, highly plastic clays.

BRICK-CLAY. A term including almost any impure clay which can be molded into bricks.

TERRA-COTTA CLAY. A grade of clay used for making terra-cotta (q.v.). It includes many varieties.

SLIP-CLAY. An easily fusible clay, which melts to a translucent glass, and is used for glazing the cheaper grades of pottery.

POTTERY-CLAY. A term applied to any clay used in the manufacture of pottery.

SAGGAR-CLAY. A grade of fire-clay used for making saggars, or vessels in which fine pottery is placed during baking in the kiln.

ALUM-CLAY. A clay containing a large amount of alum.

MARLY CLAY. A clay containing from 20 to 30 per cent. of lime carbonate.

GUMBO CLAY. A very plastic, sticky clay, found in many localities in the Central States, and often used in the manufacture of railroad ballast.

BALL-CLAY. A plastic, white burning clay, used as a bonding ingredient in white-ware and porcelain bodies.

CLAY MINING AND WORKING. The preparation of clay for use in the plastic arts is a simple process, owing to the accessibility of clay-banks and strata, and the ease with which the material can be separated from the other substances with which it is commonly found. After preliminary exploration and testing, the first thing to be done is to remove in cars, wagons, or carts the top layer of dirt. The digging out of the clay itself is usually done in successive pits, the dirt from the pit under excavation being thrown into the pit that has just been dug. In digging clay, a gouge-spade is used, which differs from the ordinary spade in having the blade cylindrical and the upper edge broader. A platform of boards is placed beside the pit, on which the clay is thrown and sorted. Two

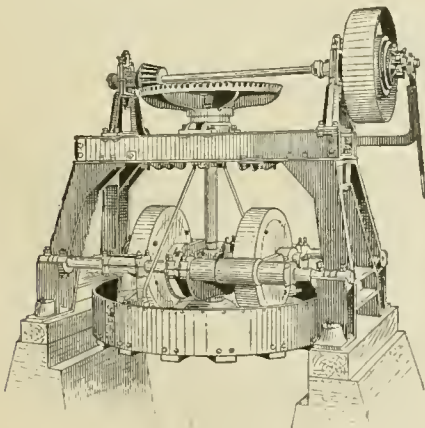
workmen handle each spadeful of clay; the first merely loosens it up, while the second cuts out any nodules of pyrite or other foreign matter, and then throws the clay onto the platform, where it is sorted for ware, brick, or whatever product it is best suited. When clay is very hard, it is first loosened with a pick. Dynamite is sometimes employed to break up a bank into loose pieces. Occasionally, mining underground is necessary to reach a desired quality of clay; and this method will be more and more common as the best grades of superficial clays are exhausted. The clay having been mined and sorted, it is transported to the factory for further manipulation.

Clay-working or tempering of some sort is generally required before clay can be used, and particularly before it can be molded into brick, pottery, sewer-pipe, or tiles. Reduction to a plastic state may be effected by wet or dry grinding, screening, pugging, washing, or by the more natural process of weathering; or, a combination of two or more of these methods may be employed. The screening and washing may be so arranged as to remove foreign material. It must be understood that the term 'clay-working,' as here used, is limited to the preparation of the raw material for molding or forming, the other processes being treated separately, under the various clay products, as will be the matter of drying; while burning, for the most part, will be discussed under **KILNS**.

Weathering is a self-explanatory term. The time involved may range from months to years, but is more often the shorter period. With improvements in machinery and methods, less dependence is placed on this process than formerly.

Soaking, like weathering, is a natural process, but it is now used only under primitive conditions, and where the clay is molded in a soft form, without other working. The clay is simply shoveled into pits, say 4 × 6 feet in extent, and soaked in water over night.

Ring-pits are 25 to 30 feet in diameter, 3 feet deep, lined with brick or boards. An iron wheel is passed over or through the clay, back and forth, mixing in the sand, in case any is used. Clay for some 30,000 bricks may be tempered in six hours.



DRY-PAN CLAY-GRINDING MACHINE.

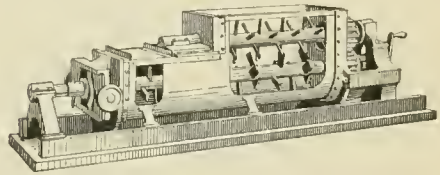
Grinding is accomplished by passing the clay between rolls, or in dry pans, the former process

being particularly applicable to shales. The pans are 7 to 9 feet in diameter, with either perforated floors or sides, through which the material falls as soon as it has reached the desired fineness. The pan revolves horizontally and by means of friction motion is imparted to two iron wheels, mounted in the pan, 6 to 14 inches wide, weighing 2000 to 6500 pounds each. A pan with one-eighth-inch holes has an average capacity of 100 tons of clay per day of ten hours.

Screening is sometimes employed for clay which has passed the dry pan. Screens may be inclined sieves, either fixed or shaking, and rotary cylindrical or octagonal in form. They demand much attention to prevent clogging, and require heavy repairs, but nevertheless are cheap and simple in operation.

Wet pans are much like dry pans, only their bottoms are not perforated, and scrapers are placed in front of the wheels, to throw up the clay. They may be discharged through a trap-door or by means of an automatic shovel. One of their chief advantages is rapidity, only two or three minutes being required to temper a charge for brick and four or five minutes for sewer-pipe.

Pug-mills appear to be used more than other classes of tempering machines. They are either vertical or horizontal, but in either case they have a central revolving shaft, fitted with radial knives extending nearly to the surrounding cyl-



COMBINED MIXING AND PUGGING MACHINE.

inder in which the clay is placed, or else fitted with a worm screw. Both knives and screw force the clay forward, as well as work it thoroughly, and by changing the angle of the adjustable knives the speed of the passing clay may be regulated. Water is admitted as desired and needed. When the clay is deficient in redness after burning, hematite may be added to the pug with clay. Pug-mills are compact, and require less power than ring-pits.

Washing is effected by a variety of processes, ranging from simple to complex. All of them involve a reduction of the clay in water to a semi-fluid state, or even to a state of suspension, which may be brought about by revolving paddles or blades, mounted on a shaft in a cylinder or trough, or by any thorough stirring. The heavier, coarser impurities may be deposited in a vat by sedimentation. The water, with the remaining clay, may be removed by siphoning or carefully poured off, and the clay allowed to settle. This process is sometimes called ebullition, particularly where it is repeated many times to recover fine-grained material. The process of sedimentation may be altogether too slow, especially where large quantities of clay are to be treated, and in such a case the clay and water, after being reduced, as described, to what is known as slip, may be passed through shaking-screens of wirecloth, having forty meshes to

the incl. It is then sent to an agitator, or large tank fitted with revolving paddles, to prevent sedimentation, from which tank the screened slip is forced by means of compressed air into a series of canvas-lined compartments, known as a press, where the water is expelled by the force of the air. The press being loosened, the clay is removed in sheets or cakes one to two inches thick, weighing 30 to 40 pounds each, after which it is ready for the pug-mill. Washing is used in the preparation of some sorts of clay for making into pottery.

BIBLIOGRAPHY. Book, *Die Ziegelindustrie* (Leipzig, 1897); Dummiler, *Handbuch der Ziegel-fabrikation* (Halle, 1897); Ries, "The Clays of New York: Their Properties and Uses," in *New York State Museum Bulletin No. 35* (Albany, 1900—contains much general information on the properties of clay and the methods of manufacture); Young, *The Ceramic Arts* (New York, 1878); Prime, *Pottery and Porcelain of All Times and Nations* (New York, 1878); Barber, *Pottery and Porcelain of the United States* (New York, 1900); Langenbeck, *The Chemistry of Pottery* (Easton, Pa., 1896). Among the more important works issued by geological surveys of States are the following: Blatchley, "Clays of the Coal-Bearing Counties of Indiana," in *Twentieth Annual Report of the Geological Survey of Indiana* (Indianapolis, 1896); Branner, "Bibliography of Clays and the Ceramic Arts," in *United States Geological Survey Bulletin No. 143* (Washington, 1896); Buckley, "The Clays of Wisconsin," in *Wisconsin Geological Survey Bulletins*, vol. ii., part i. (Madison, 1901); Cook, "The Clays of New Jersey," in *New Jersey Geological Survey Report for 1878* (Trenton, 1878); Orton, "Clays and Clay-Working Industries of Ohio," in *Ohio Geological Survey*, vol. vi., part i. (Columbus, Ohio, 1893); Ries, "The Clays of Alabama," in *Alabama Geological Survey Bulletin No. 6* (Jacksonville, Fla., 1900); Ries, "The Clays and Clay Industries of North Carolina," in the *North Carolina Geological Survey Bulletin No. 13* (Raleigh, N. C., 1897); Ries, "The Clays and Shales of Michigan," in *Michigan Geological Survey*, vol. viii. (Lansing, Mich., 1901); Wheeler, "The Clays of Missouri," in *Missouri Geological Survey*, vol. xi. (Jefferson City, Mo., 1896). See ALUMINA; SHALE; PIPE-CLAY; KAOLIN; FIRE-CLAY; LOAM; SOIL; BRICK.

For the character, distribution, and methods of manufacture in the United States, consult: *The Mineral Industry* (New-York, 1892 et seq.); also, Davis, *Practical Treatise on the Manufacture of Bricks, Tiles, and Terra-Cotta* (Philadelphia, 1895).

CLAY, CASSIUS MARCELLUS (1810-1903). An American abolitionist and politician, born in Madison County, Ky. He graduated at Yale in 1832, returned to Kentucky to practice law, and was elected to the State Legislature in 1835, in 1837, and in 1840, but in 1841 failed of reelection on account of his strong anti-slavery opinions. In 1844 he made speeches in the Northern States in advocacy of the election of Henry Clay to the Presidency, and in the following year opposed the annexation of Texas, and established at Lexington, Ky., *The True American*, a vigorous anti-slavery paper, which, however, was suppressed by a mob, but was revived by Mr. Clay, and was published thereafter in Cincinnati. He

volunteered for service in the Mexican War in 1846, and was taken prisoner. In 1850 he left the Whig Party, and was the Anti-Slavery candidate for Governor. In 1860 he supported Lincoln, and in 1861 was appointed Minister to Russia, but returned to the United States in 1862, and was made major-general of volunteers. In 1863, however, he resigned, and was again appointed Minister to Russia, where he remained until 1869. He supported Greeley in 1872 and Tilden in 1876, but went over to the Republican Party to vote for Blaine in 1884. In the campaign of 1896 he was in the gold-standard wing of the Democratic Party. Consult his *Life, Memoirs, Writings, and Speeches* (Cincinnati, 1886).

CLAY, CLEMENT CLAIBORNE (1819-82). An American politician, born at Huntsville, Ala. He graduated at the University of Alabama in 1835, and was admitted to the bar in 1840. From 1842 to 1845 he was a member of the State Legislature, from 1846 to 1848 was judge of the Madison County Court, and in 1853 was elected to the United States Senate. Upon the secession of his State he withdrew from the Senate, and was forthwith elected to the Confederate Congress. Having taken refuge in Canada at the overthrow of the Confederacy, he later gave himself up, and in 1865-66 was imprisoned at Fortress Monroe with Jefferson Davis.

CLAY, FREDERICK (1840-89). An English musician. He was born in Paris, received his education under Molique in Paris and Hauptmann in Leipzig; returned to England in 1860, and wrote several operas and operettas, which were successful. His works include: *Constance* (1865); *Happy Arcadia* (1872); *Don Quixote* (1875); *Princess Toto* (1875); *The Golden Ring* (1883); and the *Black Crook*, with Jacobi (1873); also incidental music to *Twelfth Night*, songs, part-songs, and cantatas.

CLAY, GREEN (1757-1826). An American soldier. He was born in Powhatan County, Va.; became a pioneer settler in Kentucky, then a part of Virginia, about 1776; represented the district for some time in the Virginia Legislature, and was a member of the State Constitutional Convention of 1799. In 1813 he led the force of 3000 which relieved General Harrison, then besieged by the British and Indians at Fort Meigs, and afterwards defended that fort against General Proctor and Tecumseh. He was the father of Cassius Marcellus Clay, and a cousin of Henry Clay. See FORT MEIGS.

CLAY, HENRY (1777-1852). An American statesman, known for his skill in devising compromises, as the 'Great Pacificator.' He was born April 12, 1777, in a neighborhood called 'The Slashes,' in Hanover County, Va. His father, a Baptist clergyman in humble circumstances, died when Henry was only four years old; and his mother, who seems to have been a woman of forcible character, was left ill provided for. Mrs. Clay married again in a few years, and her second husband secured for Henry the position of clerk in a retail shop in Richmond. This careful stepfather, however, noting the brightness and promise of the lad, used his influence in obtaining for him an appointment in the office of the clerk of the High Court of Chancery, where he remained for four years. Here he attracted the notice of the Chancellor, George Wythe, and

was employed by him to copy documents. The intimate association with Chancellor Wythe was an important influence on Clay's life and development; for he had received almost no schooling, and he never studied regularly, save for one year in the office of Robert Brooke, then Attorney-General of Virginia. Clay was admitted to the bar at twenty, but he soon left Richmond, and sought the fuller opportunities of the West, at Lexington, Ky. Here his attractive personality and his skill as a speaker won him friends, and made him a leading jury-lawyer. It was not long before he turned his attention to politics, and when, in 1799, the revision of the Kentucky Constitution was undertaken, Clay was found playing an active and honorable part with the minority, and risking his personal prestige by his advocacy of the gradual abolition of slavery. This stand might have cost him dear, had he not soon afterwards been able by his eloquence to aid his State heartily in opposing the Alien and Sedition Laws. He married in 1799, rose steadily in his profession, and was elected to the State Legislature in 1803. In 1806, having been appointed to represent Kentucky for an unexpired term in the United States Senate, he took from the first a conspicuous part in the public business, bringing in a number of resolutions and sitting on several committees. His first speech—one on the bill for a bridge across the Potomac—indicates his future course as one of the most earnest advocates of the policy of internal improvements. Scarcely had he returned to Kentucky when he was reelected to the State Legislature and made Speaker. It was at this time that, sharing the rapidly growing hostility toward England, and desiring to foster domestic manufactures, he introduced the resolution that all members of the Legislature should wear no clothing made in foreign countries—a proposal that Humphrey Marshall, a Federalist, stigmatized as the utterance of a demagogue. Angry words were passed, a challenge followed, and in the duel that was fought both parties were slightly wounded. In the winter of 1809-10 Clay was again sent to fill a vacancy in the Senate, where he continued to be the champion of the protection of home manufactures. When the question of chartering the United States Bank came up, Clay opposed the measure as corrupt and unconstitutional; and his remarks on this occasion were treasured up to be used with great effect against him when, in 1816, a revival of the matter made manifest an alteration in his views.

Entering the National House of Representatives in 1811, Clay was chosen Speaker as soon as he appeared, and as leader of the vigorous democracy sprung up since the Revolution, he practically forced the war with England, speaking with rash confidence of the ease with which Canada could be overrun by his fellow Kentuckians. He supported the war with all his eloquence, in and out of Congress, and was in consequence known as the 'War Hawk'; he advocated an increase of the army, and aroused much enthusiasm for his measures. When the war seemed nearly a failure, he was one of the commissioners to arrange terms, resigning the Speakership in January, 1814. In spite of the disappointment the war had brought to his hopes, he contributed much to the success of the commissioners, who were far superior to the British representatives opposed to them, and who secured the best

possible terms in the Treaty of Ghent. He resisted especially the British claim to the right of navigating the Mississippi. On his return in 1815, Clay, as the leading war statesman, was royally welcomed. During his absence he had been reelected to the House of Representatives, and, declining the offer of the mission to Russia, he took his seat and was chosen Speaker—an office which the later tender of a Cabinet place did not induce him to resign. The tariff of 1816, which was moderately protective, was urged by Clay, on the ground that certain industries must be built up for the nation's safety during war. This same year he advocated the rechartering of the National Bank to renew specie payments and to prevent further distress, and with Calhoun he helped to pass the bill for internal improvements vetoed by Madison. The Fifteenth Congress met December 1, 1817, and Clay was again elected Speaker. In this session he continued to assert the power of Congress to construct internal improvements, and he pleaded earnestly for the recognition of the South American republics, a cause always dear to his warm heart.

Clay was again chosen Speaker on the meeting of the Sixteenth Congress and continued to be its leading member, frequently criticising Monroe's administration in hard terms. This was the period of the great contest over the admission of Missouri.

Clay, though not the author of the Missouri Compromise of 1820, did bring about the compromise of the next year, by which it was agreed that Missouri should be admitted (without restriction as to slavery) on her promise not to prevent citizens of other States from settling within her borders. Declining reelection to the following Congress, he did not appear in active politics again until 1823, when he reoccupied the Speaker's chair. In the election of 1824 he was a candidate for the Presidency, together with Crawford, Jackson, and Adams.

The Electoral College failing to elect, the choice between the three highest candidates fell to the House, where Clay, who had come fourth and was thus not eligible for election, cast his strength for Adams. Soon after the latter's inauguration, Clay was appointed Secretary of State—a fact which gave point to the cry of 'Bargain and corruption,' which, though baseless, and again and again refuted, never ceased to injure him in his political career. His relations with Adams were denounced by John Randolph as the "combination of the Puritan with the blackleg," language which provoked a challenge from Clay; but neither party was wounded in the duel that ensued, Randolph refusing to fire at his adversary the second time. The Secretaryship of State, formerly regarded as the stepping-stone to the Presidency, proved an obstacle to Clay, and though he made an excellent officer, he regretted his long absence from Congress, where he could always lead. A strong opponent of General Jackson as a candidate for the Presidency, he retired with Mr. Adams after the latter's defeat in 1829. Two years later he was elected to the Senate. Here, in the difficult rôle of Senator and Presidential candidate, he was prominent in his advocacy of the protective system, which he dubbed unreasonably, but successfully, the 'American system.' Unanimously nominated by the Whigs, Clay was overwhelmingly defeated by Jackson

(1832), largely on account of his tariff ideas, and his unwise choice, as a party issue, of the defense of the National Bank. When the Nullification controversy came up, Clay's compromise of 1833 prevented a resort to arms by satisfying South Carolina with regard to the reduction of the obnoxious tariff and rendering the Force Bill unnecessary. In the subsequent anti-slavery agitation he occupied a moderate position, but lost few opportunities of opposing the administration of Jackson. Throughout this period of his career Clay shared the honors of the Senate in its time of meridian glory with Daniel Webster, John C. Calhoun, and T. H. Benton.

During Van Buren's Presidency, Clay unsuccessfully opposed the administration measure of an independent treasury system, desiring in its stead the establishment of a national bank; but after Harrison's election he procured its repeal, the apparent victory proving, however, far from permanent. In the election of 1840 he was chagrined at not receiving the Whig nomination, but supported Harrison, and after the latter's death endeavored to carry out the Whig policy, especially with regard to rechartering a national bank. In this attempt he was thwarted by the vacillation and ambition of President Tyler.

After the breach between the 'Tyler men' and the 'Clay Whigs' became apparently irreconcilable, Clay resigned his seat in the Senate and retired to private life (1842). He was nominated for President in the campaign of 1844, and defeated by James K. Polk. Clay's defeat was due to his injudicious writing of letters, in which he did not take a stand upon the question of the admission of Texas that satisfied the more extreme opponents of slavery. He was again and for the last time spoken of as an aspirant for Presidential honors in the convention that nominated General Taylor in 1848. Meanwhile he had on the whole lived in retirement, but had watched with anxiety the growth of friction between North and South consequent upon the Mexican War. In 1848 he was reelected to the United States Senate.

Taking his seat in the Senate in the winter of 1849, and still more alarmed at the fierce display of sectional feeling on the slavery question, Clay interposed in the cause of peace with the series of resolutions subsequently known as the Compromise of 1850 (see COMPROMISE MEASURES); and, in a stirring speech, delivered in spite of his advanced age and increasing infirmity, with all his accustomed energy and fire, he appealed with great effect to the patriotism of his hearers for the restoration of harmony and the preservation of the Union—an effort which was rewarded by the triumph, for a time at least, of his pacific policy. His last speech in the Senate was on the subject of a revision of the tariff of 1846. Unable to occupy his seat for more than a few days of the session of 1851-52, owing to his failing health, he continued to the end to manifest an interest in public affairs. The last incident of importance in his career was his interview with Kossuth, when, a short time before his death, he warned the Hungarian patriot of the futility of soliciting the interference of the United States in the internal affairs of Europe, and declared the true policy of this country in dealing with foreign nations to be that set forth by Washington in his Farewell Address. Sinking rapidly after this, he died in

Washington on June 29, 1852, in the seventy-sixth year of his age.

Clay is one of the most attractive figures in American history. No statesman has possessed more magnetism or been a more gallant party leader. The wisdom of many of his policies may be doubted, but his own zeal, integrity, and brilliancy as an advocate cannot be denied. His oratorical powers have been traditional only, because his speeches, partly on account of his lack of culture, have not held the attention of readers; but both in the Senate and on the platform he yielded in fire and charm of eloquence to none of his great rivals. His patriotism is above suspicion, but he was unfortunate in living in a border State and in occupying a middle position between the irreconcilable extremes of freedom and slavery. This fact made him 'The Great Pacificator,' but it probably cost him the Presidency, and has somewhat lowered his standing in history. In private life Clay was not free from some of the vices so prevalent among the men of his comparatively coarse period, but he was essentially of a fine nature and made hosts of loyal friends. Perhaps the impression he made upon his contemporaries cannot be better described than by the statement that Clay was Abraham Lincoln's "beau ideal of a statesman."

For the most complete edition of his speeches and writings, consult: Colton, *Life and Times of Henry Clay* (revised edition, 6 vols., New York, 1864); and for his biography, Schurz, *Henry Clay*, "American Statesmen Series" (Boston, 1887). See also the histories of Schouler and Rhodes.

CLAYBORNE, WILLIAM. See CLAIBORNE, WILLIAM.

CLAY CENTRE. A city and the county-seat of Clay County, Kan., 87 miles west by north of Topeka; on the Republican River, and on the Union Pacific, the Chicago, Rock Island and Pacific, and other railroads (Map: Kansas, E 2). It contains a private hospital and a fine court-house. The principal industrial establishments are flour-mills, cigar-factories, foundry and machine-shop, steel-tank factory, brick-works, broom-factory, etc. The city has good water-power, which is utilized by the electric light and power plant, and by some of the manufacturing factories. There are two large greenhouses, which make extensive shipments all over the State. Population, in 1890, 2802; in 1900, 3069.

CLAY IRONSTONE. The name applied to compact, argillaceous varieties of siderite, the carbonate of iron. It frequently occurs in the form of concretions, which may be so close together in some particular layer as to form a continuous band. They are especially abundant in some beds of the Carboniferous, and at times serve as a low grade of iron ore. See IRON; BLACKBAND IRONSTONE.

CLAY-MARL. A calcareous variety of clay, containing from 40 to 60 per cent. of carbonate of lime. It is used as a fertilizer, and also in the manufacture of Portland cement. Clay-marls are found in many parts of New York, New Jersey, Michigan, Illinois, Indiana, and other Northern States, and in the West. They grade into true marls. See MARL; SOILS.

CLAY-PLANTS. The early stages of vegetation on clay soil resemble those on rock areas, and are treated under the head of ROCK-PLANTS.

The late stages are Mesophytic (q.v.). See FORESTS; GRASS-LANDS.

CLAYPOLE, NOAH. A character in Dickens's *Oliver Twist*. A fellow-apprentice of Oliver's at Mr. Sowerberry's, the undertaker. He marries Charlotte, robs his master's till, and joins Fagin's company of pickpockets in London. He is the spy on poor Nancy, who causes her murder by Sikes, and afterwards turns King's evidence.

CLAYS, klās, PIERRE JEAN (1819-1900). A Belgian painter, born at Bruges. He studied in Paris under Gudin, and, like his master, became a painter of marine scenes. After his return to Belgium, he sent pictures to the Salon almost annually. His works are notable for their breadth, luminosity, and sincerity. As an interpreter of water, whether stormy or calm, he had few equals. He was awarded a second-class medal at the Exposition of 1878, and received the decoration of the Legion of Honor in 1875. Among his best paintings are: "A Squall on the Scheldt;" "Canal in Zealand;" "Beached Near Amsterdam;" "Calm in Zealand;" and "Open Sea" (1889).

CLAY-SLATE. See SHALE.

CLAYTON, AUGUSTINE SMITH (1783-1839). An American jurist, born at Fredericksburg, Va. He graduated at the University of Georgia in 1804, and in 1819 was elected judge of the Superior Court of the Western Circuit in Georgia. While holding that office he supported the State authorities in their occupation of territory of the Cherokee Nation, but the United States Supreme Court decided against the legality of the State's action. For differing with the Legislature on one point of the controversy, however, he was removed from office. He was elected to Congress in 1831, served two terms, took an active part in the opposition to the tariff and to the United States Bank. He was reputed to be the author of *Crockett's Life of Van Buren*.

CLAYTON, ESTELLE. An American actress and dramatic writer. She was born in New York. Her family name was Evesson. After the death of her father, she went upon the stage (1878) with a traveling company, and later in that year she attracted notice as Agnes Wickfield, in *Wilkins Micawber*. She was with Augustin Daly in 1879-80, and later for a time with Dion Bouicault. In 1882-83 she appeared as Nora in *Esmeralda*, at the Madison Square Theatre; also in *Hazel Kirke*, and as Constance in *Young Mrs. Winthrop*. In 1885 she produced her play of *Tric-trin*, at the Madison Square. She became the wife of Charles W. Durant in 1888. The same year she produced a dramatization of *The Quick or the Dead*, with which she afterwards toured successfully in the South. She is the author also of the texts of the operas *Paulita* (1890); *The Viking* (1895); and of *A Puritan Romance*, a comedy produced at the London Vaudeville, in 1897.

CLAYTON, JOHN (1693-1773). An American botanist. He was born in Fulham, England, but in 1705 emigrated to Virginia, where for fifty-one years he was clerk of Gloucester County. Two great volumes and a *hortus siccus* of Virginia plants were left by him; but the manuscripts were destroyed by fire, together with the records of Gloucester, at the beginning of the Revolution.

CLAYTON, JOHN MIDDLETON (1796-1856). An American jurist and politician, born in Dagsborough, Del. He graduated at Yale in 1815, was admitted to the bar in 1818, and became a leading lawyer in his State. He was for many years (1829-37, 1845-49, and 1851-56) a prominent member of the United States Senate, and in 1849 became Secretary of State in the Cabinet of President Taylor. In 1850 he negotiated with the British Government the famous Clayton-Bulwer Treaty (q.v.), which guaranteed the strict neutrality of any interoceanic canal that might be built across the American Isthmus.

CLAYTON, POWELL (1833-). An American soldier and politician, born in Bethel, Pa. He followed his profession of civil engineering at Leavenworth, Kan., and at the outbreak of the Civil War became captain in the First Kansas Infantry, in the Federal Army. He rose to the rank of brigadier-general during the struggle, and at its close became a planter in Arkansas, of which State he was chosen Governor in 1868. He was a member of the Senate from 1871 to 1877, and was a member of every National Republican Convention from 1872 to 1896. He was appointed Minister to Mexico in 1897.

CLAYTON-BULWER TREATY. A treaty between the United States and Great Britain, signed, after prolonged negotiations between Secretary of State John M. Clayton (q.v.), on the one side, and Sir Henry Bulwer, special Ambassador of Great Britain, on the other, on April 19, 1850, the ratifications being exchanged on July 4. Its aim was, mainly, to facilitate the construction of an interoceanic canal across the American Isthmus, and incidentally to prevent the encroachment of either contracting power upon the territory of the Central American States; and its main provisions were as follows: (1) Neither power was ever to "obtain or maintain for itself any exclusive control over the said ship-canal," or to "occupy, or fortify, or colonize, or assume or exercise any dominion over Nicaragua, . . . or any part of Central America." (2) The two powers formally agreed to guarantee the protection and neutrality of the canal. (3) They further agreed to invite friendly powers "to enter into stipulations with them similar to those they had entered into with each other," and also to enter into treaties with the Central American States "for the purpose of more effectually carrying out the great design of this convention." (4) Vessels of the two powers were, while traversing the canal in time of war, to be exempt from detention, blockade, or capture. (5) The protection of the two powers was extended to any other practicable communications across the Isthmus, whether by railroad or canal, the intention being "to establish a general principle," as well as to settle one particular object. At the time the ratifications were exchanged, both powers issued explanatory declarations, Great Britain announcing that "her Majesty's Government do not understand the engagements of that convention as applying to her Majesty's settlement at Honduras, or its dependencies;" the United States, that the treaty was not understood "to include the British settlement in Honduras, commonly called 'British Honduras,' as distinct from the State of Honduras, nor the small islands in the neighborhood of that settlement, which may be known as its dependencies." Disputes arose over the terri-

torial claims of Great Britain in Central America, and her assumption of a protectorate over the Mosquito Indians, conflicting interpretations being placed on various provisions of the treaty by the two powers. Another treaty, the Dallas-Clarendon treaty, designed to settle the pending disputes, was signed in October, 1856, and was ratified by the Senate soon afterwards, with the addition of various amendments, which, however, the British Government refused to accept. Disputes continued almost up to the time of the Civil War; but in 1860 Great Britain concluded treaties with Honduras and Nicaragua, which provided for the cession to the former of the Bay Islands, and the relinquishment of the British protectorate over the Mosquito Indians. President Buchanan thereupon announced, in his message for 1860, that "the discordant constructions of the Clayton-Bulwer Treaty between the two Governments . . . have resulted in a final settlement, entirely satisfactory to this Government." Nevertheless, after the close of the war, controversies again arose, and in 1881 the treaty was the subject of a compromise between Lord Granville and Secretary of State Blaine, the latter contending that any inter-oceanic canal across the American Isthmus should be under the political control of the United States; that the United States would view with grave concern the interference of European powers; and that the treaty should be so modified as to make it conform to conditions which had materially changed since 1850. Secretary of State Frelinghuysen, who succeeded Blaine, in December, 1881, went further, and contended that the treaty had become obsolete, and was in reality no longer binding on either power; while, on the other hand, Lord Granville asserted that the treaty had never been abrogated, and was still in force. Finally, by the Hay-Pauncefote Treaty, which was ratified by the United States Senate in December, 1901, the Clayton-Bulwer Treaty was formally annulled. Consult Travis, *The History of the Clayton-Bulwer Treaty* (Ann Arbor, Mich., 1900)—vol. iii. of the "Publications of the Michigan Political Science Association."

CLAYTONIA (after John Clayton, a Virginian botanist), or **SPRING BEAUTY**. One of the most beautiful of the early spring flowers of the United States. The plants are low, succulent herbs, growing in rich ground of bottom-lands. The delicate, rose-colored flowers are striped with pink veins, and the leaves are linear or oblong. Two species, *Claytonia Virginica* and *Caroliniana*, are common in the United States. *Claytonia perfoliata* is found on the Pacific Coast, and in Mexico and Cuba. Other species of this genus are known in Europe and Asia, one of them, *Claytonia tuberosa*, affording tubers which are eaten by the peasants of Siberia.

CLAZOMENE, klā-zōm'ē-nē (Lat., from Gk. Κλαζομεναι, *Klazomenai*). One of the twelve cities of Ionia, on the west coast of Asia Minor. It was situated on the south shore of the Hermæan Gulf, west of Smyrna. Apparently about the time of the formation of the League of Delos, a part of the inhabitants seem to have moved to an island near the coast. Alexander the Great connected the island with the mainland by a dike, and the city subsequently extended over the peninsula thus formed. The city was famous as the birthplace of the philosopher Anaxagoras

(q.v.). The modern Vurla is near the site of Clazomene. Consult Labahn, *De Rebus Clazomeniorum* (Greifswald, 1875).

CLÉANTE, klé'ānt'. (1) A character in Molière's *Malade imaginaire*, in love with Angélique. (2) In Molière's *Tartuffe*, the high-minded brother-in-law of Orgon. (3) In Molière's *L'Acare*, the son of the miser Harpagon. Both father and son desire to marry Mariane; but the miser prefers the recovery of his gold to the lady, who becomes the wife of Cléante.

CLEAN'THE. In Fletcher's *Mad Lover*, the sister of Siphax of Paphos.

CLEANTHES, klé-ān'thēz (Lat., from Gk. Κλεάνθης, *Kleanthēs*) (c.300-220 B.C.). A Stoic philosopher. He was born at Assos, in Troas. His poverty was such that he had to work all night at drawing water, in order to obtain money for his support, and to pay his class fee while attending the lectures of Zeno, whom he succeeded as head of the Stoic School about B.C. 263. He died of voluntary starvation when about eighty years old.

None of his writings are extant, except a *Hymn to Zeus*, much admired, preserved by Stobæus (Ecl. i. 2, 12). It is an admirable union of religious feeling and philosophic thought. The fragments have been collected by Wachsmuth, *Commentatio de Zenone et Cleanthe* (1874). Consult: Ritter and Preller, *Historia Philosophiæ Græcæ* (Gotha, 1888); Zeller, *Philosophie der Griechen* (Leipzig, 1869-82).

CLEANTHES. (1) In Dryden's *Cleomenes*, the friend of Cleomenes. (2) In Massinger, Middleton, and Rowley's play, *The Old Law*, the son of Leonides, who shows his filial piety by preserving his aged father from the operation of a law condemning to death all men over eighty years of age.

CLEAR, CAPE. See CAPE CLEAR.

CLEARANCE. In the mercantile marine, a permission from the custom-house officers, or the emigration officers, or both, for the departure of a ship from a port, showing that all the formalities have been observed, and all dues, etc., paid. If a foreign vessel, she must also be certified by the consul of the nation to which she belongs. Hence the expression 'cleared out' originally used in reference to the departure of a particular ship.

CLEARCHUS, klé-ār'kūs (Lat., from Gk. Κλέαρχος, *Klearchos*). A Spartan commander of the fifth century B.C., the son of Ramphias. After serving in the Hellespont and at the battle of Cvziens, he became Governor of Byzantium, where he ruled with tyrannical harshness. During his absence in Asia, the town was surrendered to the Athenians, and Clearchus was punished by a fine. He was afterwards sent to Thrace to protect the Greek colonies there; but, being recalled by the ephors, he proceeded to the Hellespont in defiance of their orders, and was condemned to death. He joined the younger Cyrus, for whom he levied an army of Greek mercenaries, and whom he accompanied on the famous 'March of the Ten Thousand.' He alone, of the Greeks, knew the real intentions of Cyrus; but it was not until they had proceeded too far to retire with safety that he disclosed them. At the battle of Cumaxa (B.C. 401) he commanded the right wing of the Greeks, and was tacitly recog-

nized as commander-in-chief when the retreat had begun. He was, however, treacherously seized by the Persian general, Tissaphernes, and put to death.

CLEAR/FIELD. A borough and the county-seat of Clearfield County, Pa., 172 miles east by north of Pittsburgh; on the west branch of the Susquehanna River, and on the Pennsylvania Railroad (Map: Pennsylvania, C 2). It is situated in a fertile agricultural region, in which there are also deposits of coal, limestone, and fire-clay, and has several lumber-mills, flouring-mills, brick-yards, and ships out foundry products, tanned leather, etc. Clearfield was settled in 1805, and in 1840 was incorporated as a borough. Population, in 1890, 2248; in 1900, 5081.

CLEARING-HOUSE. Clearing-house associations are unions of banks, for the purpose of securing a speedy settlement of the claims of banks against one another. The oldest of these is the London Clearing-House, which appears to have been established about 1775. The most important clearing-house in the United States is that of the city of New York, which was established in 1853. Before the establishment of clearing-houses, the process of settling the mutual claims of banks upon one another was cumbersome and tardy. Each bank was forced to send out runners, carrying to every other bank the checks and claims that it had upon them. As each bank settled periodically its bills with every other bank, there was a continual interchange of money between them. All this has been obviated by the establishment of clearing-houses, in which representatives of the several banks meet daily, for the purpose of adjusting the claims of the banks upon one another.

An insight into the workings of clearing-houses can best be obtained by a brief description of the methods pursued in the New York Clearing-House, which may be taken as typical of all the rest. The banks represented send daily to the clearing-house at least two clerks—a delivery-clerk and a settling-clerk. At the clearing-house, each bank has a desk at which the settling-clerk or clerks are seated. They bring to the clearing-house in bundles the checks, drafts, and other obligations due them from other banks, each bank being represented by a separate package. They bring also a list of the amounts due them from each of the banks in question. Before clearing begins, transcriptions of these lists are handed to the inspector. The sum total represents the aggregate amount to be settled for the day. Promptly at 10 o'clock, the delivery-clerks begin passing from one desk to another, delivering to each the package of claims of all sorts that their banks have against other banks. These claims are accepted in bulk, without examination of the items. As soon as all of the packages have been delivered, they are carried back to the banks, where an examination of the items takes place; and if there are any that are not valid, the adjustment takes place between the bank which has received them and that which presented them, without intervention of the clearing-house or rectification of the accounts drawn up there. When all of the packages have been received by the settling-clerks at the clearing-house, the latter draw up a statement of the demands made upon them. As these never balance the claims made

by their banks, it is obvious that at the close of each day's business some of the banks will be entitled to receive money and others obliged to make payments, to settle the accounts. When each clerk has made up his account, he forwards a statement of the aggregates, with the amount of the balance to be paid or to be received. When all have forwarded their accounts to the manager, and the accounts are proved by the equality of the debit and credit aggregates and balances, the manager certifies the amounts which each bank owes to the associated banks, or is entitled to receive from them.

In the London Clearing-House, for the settlement of balances a different rule prevails. Debit balances are settled by checks on the Bank of England in favor of the associated banks, and credit balances by similar checks drawn by the associated banks in favor of the creditor banks. In New York the amounts due by debtor banks are paid in cash to the clearing-house manager, who in turn pays the creditor banks. For this purpose gold certificates issued by the United States Government are used, and also clearing-house gold certificates, which represent gold coin deposited with the clearing-house, and which are valid only in the settlement of clearing-house balances.

By the aid of the clearing-house, each bank can settle all of its relations to the banks of the city by a single payment, instead of adjusting its relations with each bank separately. Furthermore, settlements are effected by the transfer of a much smaller quantity of cash than would be otherwise required. Thus, in the first year of the New York Clearing-House, average daily clearings of \$19,104,594.94 were effected by average daily payments of \$988,078.06—but 5.17 per cent. In some years the percentage of balances paid in money has fallen as low as 3 per cent., and during the entire history of the New York Clearing-House has never reached so much as 7 per cent. The aggregate New York clearings were \$5,750,455,987 in 1854, and \$77,020,672,494 in 1901—the year of maximum exchanges. The aggregate exchanges reflect not only the growth of the city in importance as a commercial centre, but also the business conditions throughout the country—rising in times of notable prosperity and sinking in eras of depression. Thus, we may contrast the clearings of \$35,461,052,826 in 1873, \$48,565,818,212 in 1881, and \$37,660,686,572 in 1890, with clearings of \$22,000,000,000 in 1874, \$25,250,791,440 in 1885, and \$24,230,145,368 in 1894.

The New York Clearing-House is by far the most important in the United States. The excellence of the system embodied in it and the facilities which it affords to banks have been so generally appreciated that the institution has been widely copied, even in some of the smaller cities. On September 30, 1901, there were in the United States no fewer than ninety clearing-house organizations, which had, in the year ending on that date, transacted clearings to the extent of \$114,190,226,021. It must be said, however, that five-eighths of the aggregate belonged to New York City. Abroad, the London Clearing-House transacted business in 1901 to the amount of \$9,561,169,000. Clearing-houses exist on the Continent of Europe, though the use of checks in daily life is far less frequent there than in England and in the United States, and the clear-

ings are not so important. On the other hand, the institution is widely known in Canada, Australia, and other English colonies.

In the United States, the clearing-house associations not only furnish the facilities for settlements among banks which have been described, but also enable the banks to act as units in matters of banking policy. They establish rules of banking practice in the interest of the banks, as a whole, which individual banks would not be strong enough to maintain. Thus, many associations fix the rates to be charged for the collection of out-of-town checks. Certain associations prohibit the issue of certified checks by the members. Many details of practice are thus regulated by clearing-house rules. These associations, too, foster among the banks a feeling of solidarity of interest, and furnish an organ through which this can find expression. In times of financial distress, it may be a matter of supreme importance to all the banks that none go to the wall; for such an occurrence may cause a run upon all the banks and a general catastrophe. The stronger banks, under such circumstances, come to the aid of their weaker brethren.

Nowhere is the function of the clearing-house in sustaining the interests of the banks, and the general credit of the community, more apparent than in the issue of clearing-house loan certificates. The ordinary clearing-house gold certificate differs from a Government gold certificate only in the fact that the clearing-house, and not the Government, is the custodian of the gold. It is preferred over the Government certificate because it can be issued in denominations better suited to the needs of the banks. With these certificates the loan certificates have nothing in common. They are issued only in times of panic, to meet temporary emergencies, and are called in and canceled as soon as their work is done. In times of panic there is an unusual demand for means of payment. Under the national banking system of reserves, which permits the country banks to deposit a portion of their legal reserves in the commercial centres, this strain is felt quite severely in the money centres. It is only to a limited extent that such emergencies can be met by restricting discounts. In preparation for a demand which can be foreseen, this usually takes place; but at the moment of the crisis, credits must be expanded and loans discounted freely, if the storm is to be weathered. Where free banking exists, this is usually done through increased note issues; but the banking system of the United States does not admit of such an increase. The clearing-house loan certificate relieves the situation by substituting certificates based, not on cash, but on securities for the cash ordinarily used in clearing-house operations—thereby placing this cash at the disposal of the banks for the use of their customers.

The clearing-house requires a deposit of securities with a committee, and issues certificates bearing a relatively high interest—in New York City, six per cent., up to a certain per cent. of the securities deposited, generally 75 per cent. It generally provides that any loss arising from the issue of the certificates shall be assessed pro rata, either upon the capital and surplus or upon the average clearings of the banks. Thus the entire credit of the associated banks is pledged for the redemption of the certificates. The interest charge makes it to the advantage of the

banks to redeem as soon as possible the certificates issued to them, and they rarely last more than a few months. This expedient was first tried by the New York Clearing-House in 1860, and has been repeated in 1862, 1863, 1873, 1884, 1890, and 1893. In the latter year the issue began June 21 and ceased September 6. The issue, the largest in the history of the clearing-house, was \$41,490,000. The last certificate was redeemed November 1, a little more than four months after the first issue. While, since 1860, these issues in New York have amounted to over \$168,000,000, there has been no loss upon them. The example set by New York was pretty generally followed by other clearing-houses in 1873, and such issues have since been authorized by other associations to meet a general financial stringency or a local emergency.

BIBLIOGRAPHY. Cannon, *Clearing-Houses* (New York, 1900); White, *Money and Banking* (New York, 1902); Jevons, *Money and Mechanism of Exchange* (London, 1875); *Report of the Comptroller of the Currency* (1896).

CLEAR LAKE. A body of water in Lake County, Cal., about 90 miles north of San Francisco (Map: California, B 2). It is about 25 miles long by from two to six miles wide; there is a contraction in its southern part, which is known as 'Lower Lake.' It is situated in an elevated and picturesque region, which is a popular resort for field and water sportsmen. Lakeport is on the west shore, and Lower Lake at the southeastern end.

CLEARNESS. A quality in painting, in which light and shade (see CHIAROSCURO) is successfully achieved without a sacrifice of purity of color.

CLEARSTORY, or CLERESTORY. The upper part of any building lighted by a row of windows; or, more strictly, the upper part of the central nave of a church, in which windows were cut above the roof of the side-aisles. The object of the clearstory is to give direct light to the nave. Clearstories appear in all early Christian basilicas, and in a different form in Byzantine churches—as, e.g. that around the base of the dome of Saint Sophia. They are lacking in a certain class of early Romanesque churches with tunnel vaults and early groin vaults, especially in the south of France, Burgundy, and Lombardy, because the builders, who were then experimenting with vaulting, were afraid of its thrust, and did not dare to raise the spring of the main vault sufficiently above the supporting side-vaults to allow of the insertion of a line of windows below the spring. Such were San Ambrogio at Milan (groin vaults), Saint Etienne at Nevers, and Saint Sernin at Toulouse (tunnel vaults). After the twelfth century clearstories were again the rule.

CLEARWING. Any of the small moths of the family *Egeriidae*, with transparent wings, the caterpillars of which bore into the stems of trees or plants, and hibernate there. Many of the clearwings are so small, brilliantly colored, and unlike moths, that they are easily mistaken for wasps or flies. The most common is the currant-borer (*Egeria tipuliformis*), imported to America from Europe, and sometimes highly destructive to currant and gooseberry bushes. The peach-borer (*Sanina exitiosa*) is a pest in peach orchards.

CLEAVAGE (from *cleave*, AS. *clēofan*, Ger. *klieben*, to cleave, Lat. *glubere*, to peel, Gk. *γλύφειν*, *glyphēin*, to hollow out). In geology, a property induced, under certain conditions, during deformation in a rock by virtue of which the rock may be readily split into parallel layers or rods, i.e. parallel to a plane or line. It is a property possessed also by certain original gneisses that have not undergone deformation since their first solidification. Cleavage, in rare cases, may be parallel to planes of bedding that may be present in the rock-mass. The essential condition of rock-cleavage is a parallel dimensional arrangement of the constituent mineral particles of the rock. In certain minerals, such as mica, parallel dimensional arrangement carries with it a parallelism of the mineral cleavage. The cleavage of a rock may be observed to occur parallel to the greater diameters of the mineral particles, or to the parallel mineral-cleavages. When the two coincide, as in the case of mica, the rock-cleavage produced is parallel to one plane. Where they do not coincide, two rock-cleavages may be produced at angles to each other, as in the case of feldspar, although one may be conspicuous and the other obscure. The property of rock-cleavage is observed in rocks that have yielded to pressure by deformation without conspicuous fracture. This deformation can be induced only where the rock is under such great pressure from all sides that it flows rather than fractures. The planes or lines of rock-cleavage are further observed to be normal to the directions in which the rock-masses have been most shortened.

A number of processes probably coöperate to induce the parallel arrangement of mineral particles during the shortening of the rock-mass. Chief among these is the recrystallization of old mineral particles and the crystallization of new particles through the agency of contained water. This process results in the elongation of the mineral particles of the rock in the plane or line of greatest elongation of the rock-mass as a whole, and in shortening normal to this direction: in other words, it results in the flattening of the mineral particles through solution and deposition of mineral material. Other processes which produce rock-cleavage are the rotation into parallel position of previously existing particles whose axes have unequal length, and the flattening *in situ* of original mineral particles through the process known as gliding—i.e. differential movement along certain definite planes and crystals without fracture. Cleavage is found in almost all varieties of rocks which, under pressure, have been made to flow, although as a rule it is shown to best advantage in the finer-grained rocks. Rocks possessing the property of cleavage are called 'slates' or 'schists.'

BIBLIOGRAPHY. Phillips, "Cleavage and Foliation in Rocks," in *Report of British Association for the Advancement of Science* (London, 1856); Heim, *Mechanismus der Gebirgsbildung*, vol. ii. (Basel, 1878); Tyndall, "Comparative View of the Cleavage of Crystals and Slate-Rocks," in *Philosophical Magazine*, 4th series, vol. xii. (London, 1856); Daubrée, *Géologie expérimentale*, vol. i. (Paris, 1879); Van Hise, "Principles of North American Pre-Cambrian Geology," in *Sixteenth Annual Report of the United States Geological Survey* (Washington, 1896).

CLEAVAGE OF CRYSTALS. Most crystals, owing to the regular arrangement of the molecules, possess directions along which cohesion is at a minimum. They, therefore, tend to fracture along planes normal to these directions, which are called 'planes of cleavage.' The tendency of a crystal to cleave is necessarily the same for any plane as for any other parallel plane; in other words, cleavage-planes have direction rather than position. Cleavage-planes, in their relative perfection and number, conform to the symmetry of the crystal in which they occur. Tendency to cleave along special planes determined in position as well as in direction is described as 'parting.' See **CRYSTALLOGRAPHY; MINERALOGY.**

CLEAVE LAND, MOSES (1754-1806). An American pioneer, the founder of Cleveland, Ohio. He was born in Canterbury, Conn.; practiced law, served in the Revolutionary War, and became a brigadier-general of militia in 1796. In 1795 he joined a number of others in purchasing from Connecticut, for \$1,200,000, the tract in Ohio known as the 'Connecticut Western Reserve.' He directed the surveyors who laid out the site of the present Cleveland, which was named after him. The form of the name was altered, in 1831, to Cleveland, by a newspaper editor, who wished to economize space for a headline.

CLEAVELAND, PARKER (1780-1858). A distinguished mineralogist. He was born in Rowley, Mass.; graduated at Harvard in 1799, was tutor in mathematics there from 1803 to 1805, was chosen professor of mathematics and natural philosophy and lecturer on chemistry and mineralogy in Bowdoin College—a position which he retained until his death, although many professorships in other colleges and the presidency of his own were offered to him. He gathered a valuable collection of minerals, and published a treatise on *Mineralogy and Geology* (1816, 3d ed. 1856), which earned for him the title of 'Father of American Mineralogy.'

CLEAVERS. See GOOSE-GRASS.

CLEBSCH, klēpsch, RUDOLF FRIEDRICH ALFRED (1833-72). A German mathematician, born at Königsberg, Prussia. He studied at Königsberg, where he was a pupil of Hesse, Richelot, and F. Neumann. He held the chair of theoretical mechanics at the polytechnic school in Karlsruhe from 1858 to 1863; was made professor of mathematics at Giessen in 1863, and at Göttingen in 1868. His attention was drawn to algebra and geometry by the study of Salmon's works. In 1868 he founded, with Neumann, the *Mathematische Annalen*. His vast contributions to the theory of invariants; his use of the notion of the deficiency of a curve; his applications of the theory of elliptic and Abelian functions to geometry and to the study of rational and elliptic curves, have secured for him a pre-eminent place among those who have advanced the science of geometry. His works upon the general theory of algebraic curves and surfaces began with the determination of those points upon an algebraic surface at which a straight line has four-point contact. Clebsch undertook to render the notion of 'deficiency' fruitful for geometry—a notion found first in Riemann's *Theorie der Abelschen Funktionen* (1857). By 'deficiency' of a curve is meant the difference between the number of its double points and the

maximum number possible in such a curve. (See CURVES.) Clebsch and Cremona studied the representation of cubic surfaces on a plane through a one-to-one correspondence—a notion that has led to the study of higher correspondences between surfaces by Cayley (q.v.) and Nöther. Clebsch solved, by aid of the addition theorem of elliptic functions (see FUNCTIONS), the generalized form of Malfatti's Problem. He also solved (1862) the so-called 'Pfaflian Problem' of differential equations, by making it depend upon a system of simultaneous linear partial differential equations whose statement is possible without integration. Clebsch took a leading part in showing the great significance of the theory of invariants for the theory of hyper-elliptic and Abelian functions; and to him is due the transformation of the theory of binary to that of ternary forms. (See FORMS.) He died at Göttingen, November 7, 1872. Vol. vii. of the *Mathematische Annalen* contains an excellent article on Clebsch, in which the value of his works is estimated by Brill, Gordan, Klein, Mayer, Nöther, and other contemporaries. His *Vorlesungen über Geometrie* were edited by Lindemann (Leipzig, vol. i. 1875-76, vol. ii. 1891).

CLEBURNE. A town and the county-seat of Johnson County, Tex., 55 miles southwest of Dallas; on the Gulf, Colorado and Santa Fe Railroad (Map: Texas, F 3). It has a large trade in grain, live stock, cotton, wool, hides, and produce, besides considerable interests as a distributing centre. The town contains cotton-compresses, cottonseed-oil mills, flour-mills, foundry and machine-shop, etc.; and division offices and shops of the Gulf, Colorado and Santa Fe Railroad. Population, in 1890, 3278; in 1900, 7493.

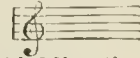
CLEBURNE, PATRICK ROXAYNE (1828-64). An American soldier, prominent as a Confederate officer during the Civil War. He was born in County Cork, Ireland; studied medicine for a time at Trinity College, England; ran away from home, and served for several years in the British Army. In 1855 he emigrated to the United States, and settled in Helena, Ark., where he studied law, was admitted to the bar, and practiced with considerable success. On the outbreak of the Civil War, he enlisted in the Confederate Army as a private, but by March, 1862, rose to the rank of brigadier-general. He commanded a brigade at the battle of Shiloh; was wounded in the battle of Perryville, Ky., on October 8, 1862; was promoted to be major-general in December of that year; was distinguished for gallantry at Murfreesboro, and at Chickamauga led a brilliant charge, and earned the title, 'The Stonewall of the West.' In the battle of Missionary Ridge he commanded the right wing of the Confederate army; subsequently took a conspicuous part, as division commander under Johnston, against Sherman, and as a corps commander under Hood, in the Atlanta campaign against Sherman, and later, in the Tennessee campaign against Thomas and Schofield; and at the battle of Franklin, on November 30, 1864, he was killed while leading a charge on the Federal works. He was one of the organizers of the 'Order of the Southern Cross,' and was one of the first men in the Confederacy to advocate the use of colored troops. Consult the biographical sketch, by General Gordon, in *Southern Historical Society Papers*, vol. xviii. (Richmond, 1889).

CLECK/HEATON. A town in the West Riding of Yorkshire, England, two and one-half miles southwest of Bradford (Map: England, F 3). It has manufactures of woollens, worsteds, and blankets. Population, in 1891, 11,800; in 1901, 12,500.

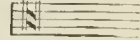
CLEDON/ISMAN'CY. See SUPERSTITION.

CLEETHORPE WITH THRUNS'COE. A progressive town and railway-junction in Lincolnshire, England, two and one-fourth miles east-southeast of Grimsby (Map: England, F 3). It owns a new market and recreation-grounds. There is an electric-lighting plant. Population, in 1891, 4300; in 1901, 12,600.

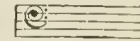
CLEF (Fr. key). A musical symbol, which is placed on the staff, to fix the pitch of one note, and thereby also to determine that of the succeeding notes. There are three kinds of clefs—viz. the G (treble), and C (tenor), and the F (bass). The G clef is placed on the second line, thus:



the C clef on the third line, thus:



and the F clef on the fourth line, thus:




The C clef is a fifth below the G clef, and a fifth above the F clef, thus:



The C clef is also placed on the fourth line for some instruments, and for the tenor part in vocal music, thus:



and in old vocal music the C clef placed on the first line was used for the soprano. The tendency at present, in vocalization, is to do away with

the C clef. The signature  is a descendant of

G, through many stages of transformation. The development of the two other clef-symbols from the letters C and F, though not so obvious to the eye, is as much a matter of history as is the former case.

CLEISHBOTHAM, klēsh'bōTH-am, JEDEDIAH. The imaginary 'collector' in Scott's series of novels, *Tales of My Landlord*. He claims to be schoolmaster and parish clerk of Gandercluch, in which capacity he meets Peter Pattieson, the equally fictitious writer of the stories.

CLEISTHENES, klis'thē-nēz. See CLISTHENES.

CLEISTOG'AMOUS FLOWERS (Gk. κλειστός, *kleistos*, that which may be closed, from κλείειν, *kleíein*, to close + γάμος, *gamos*, marriage). Relatively inconspicuous and never-open flowers, which occur, along with the ordinary flowers, in many plants, representing all of the principal alliances of the flowering plants. Cleistogamous flowers are seldom in a conspicuous position. One of the best-known illustrations is in the stemless species of violets. In these, in addition to the well-known conspicuous flowers, cleistogamous flowers occur more or less concealed near the base of the cluster of leaves and

flower-stalks. Since these flowers are never open, they are necessarily self-pollinated; but they are very fertile, and produce an abundance of seed. The significance of this dimorphism in the flowers of so many plants is not clear. It has been suggested that, in case cross-pollination is not secured by the showy flowers, the presence of self-pollinating cleistogamous flowers makes seed-production secure. However, some plants with cleistogamous flowers, as grasses and rushes, are anemophilous (wind-pollinated), so that it is not a habit entirely related to the uncertainties of pollination by insects. In comparing the development of the cleistogamous and ordinary flowers, it is discovered that the former are like the latter at various stages of development.

The following quotation from Darwin's *Different Forms of Flowers* presents some detailed differences: "In cleistogamous flowers, the petals are rudimentary or quite aborted; their stamens are often reduced in number, with anthers of very small size, containing few pollen-grains, which have remarkably thin, transparent coats, and generally emit their tubes while still inclosed within the anther-cells; and, lastly, the pistil is much reduced in size, with the stigma in some cases hardly at all developed. These flowers do not secrete nectar or emit any odor: from their small size, as well as from the corolla being rudimentary, they are singularly inconspicuous. Consequently, insects do not visit them; nor, if they did, could they find an entrance. Such flowers are, therefore, invariably self-fertilized; yet they produce an abundance of seed. In several cases, the young capsules bury themselves beneath the ground, and the seeds are there matured. These flowers are developed before, or after, or simultaneously with the perfect ones."



CLEISTOGAMY.

A plant of *Polygala polygama*, showing ordinary flowers on erect aerial stems, and numerous cleistogamous flowers on underground stems.

CLEISTOG'AMY. Flowers which remain closed through the blooming period, and hence for the most part exclude pollen from other

flowers (cross-pollination) are said to exhibit cleistogamy. See CLEISTOGAMOUS FLOWERS; POLLINATION.

CLE'LAND, WILLIAM (c.1661-89). An English Covenanting poet. He is supposed to have been born in Lanarkshire, Scotland. After leaving Saint Andrew's University, he joined the Covenanters, and at Bothwell Bridge acted as captain. He was afterwards made lieutenant-colonel of the Cameronian Regiment, under Lord Angus Cameron, which was sent to put down the uprising that followed the fall of Claverhouse at Killiecrankie. The Cameronians held out after a whole day's fighting at Dunkeld (August 21, 1689) against heavy odds; but during the action Cleland was killed. He wrote *Secular Poems and Verses*, which appeared posthumously in 1697; but he is better known through his connection with the Cameronian Regiment.

CLÉLIE, klá'lé'. The heroine of a romance of the same name, by Mademoiselle de Soudéry, originally issued under her brother's name (1656).

CLÉMANGES, klá'mánzh', NICOLAS DE (c.1360-c.1434). A French theologian—one of the ablest Roman Catholic theologians of the Middle Ages. He was educated in Paris, where he studied theology under Pierre d'Ailly. He was chosen rector of the university in 1393, and was esteemed, with his teacher and Gerson, the glory of the institution. He was an ardent advocate of reform in the Church, wrote strongly against the immoral lives of many of the higher clergy, and labored, with great pertinacity, to heal the schism then existing—especially by preventing the election of another Antipope in place of the so-called Clement VII. But when Pedro de Luna (q.v.) was elected by the Avignon Cardinals in 1394, taking the name of Benedict XIII, Clémanges became his secretary, thinking that in this position he could render a service to the divided Church. When, in 1407, it came to a breach between Benedict and the French Court, Clémanges, unjustly suspected of being the author of the bull of excommunication launched by Benedict against the King, left Avignon, and went first to his canonry at Langres, and then into the retirement of the Carthusian monasteries at Valprofonds and Fontaine-du-Bosc. Here he pursued his studies, and produced several important works upon the study of the Bible, and upon the corruptions then existing in the Church. In 1415 he exercised a great influence on the Council of Constance, though never present in person, and made a strong plea for Church unity and purity. In 1425 he returned to Paris and to his lectures on rhetoric and theology in the university, and there died, probably in 1434. His collected works, with a life by J. M. Lydius, appeared at Leyden in 1613. The often-quoted *De Ruina Ecclesie seu de Corrupto Ecclesie statu*, while frequently attributed to Clémanges, is demonstrably not his. Consult Müntz, *Nicolas de Clémanges, sa vie et ses écrits* (Strassburg, 1846).

CLEM'ATIS (Gk. κληματις, klēmatīs, brush-wood, from κλίμα, klēma, vine-shoot, from κλῖν, klan, to break). A genus of plants of the natural order Ranunculaceæ, having four colored sepals, petals small or none, and numerous one-seeded achenes, with long, generally feathery, awns. The species, which number about 150, are

herbs or shrubs, generally with climbing stems, mostly natives of temperate climates, and much scattered over the world. They possess more or less active properties. The long awns of some species give the plants a beautiful appearance even in winter. The flowers of many species are also beautiful. *Clematis vitalba*, the common traveler's-joy, is the only native of Great Britain, where it is common in the south, but becomes rarer toward the north, and is scarcely found in Scotland. The stems are capable of being made into baskets. It rapidly covers walls or unsightly objects. The fruit and leaves are acrid and vesicant; the leaves are used as a rubefacient in rheumatism, and those of other species are also employed in the same way. About twenty species are indigenous to North America, and of these *Clematis Virginiana*, or virgin's-bower, is very widely distributed and is common along wooded river-banks and roadside walls, making a very showy appearance with its graceful sprays of white flowers. Its fertile flowers are succeeded by fruit with conspicuous feathery tails. *Clematis verticillaris*, with peduncles bearing large, single, bluish-purple, and drooping flowers, is a rare species, found in rocky woods, from Maine to western New England, and thence to Virginia, Wisconsin, and northwestward. *Clematis viorna*, popularly called leather-flower, has very thick purplish sepals, ovate or oblong leaflets, fruit with very plumose tails, and grows in rich soils in the Middle and Southern States. *Clematis Pitcheri*, a species found along the Mississippi from Illinois southward, has a bell-shaped calyx, dull, purplish sepals, and noticeably reticulated leaves. *Clematis ochroleuca*, a rare species, found in Long Island, Pennsylvania, and New Jersey, has simple and entire leaves, silky beneath, and fruit with very plumose tails. Among the many species seen in our gardens are *Clematis viticella*, with its solitary, bell-shaped blossoms, and *Clematis florida* and *Clematis patens*, with large blue and purple flowers, natives of Japan. One of the most pleasing, an evergreen, with large white flowers, is *Clematis indivisa*, a native of New Zealand. Some species, as *Clematis flammula*, are found in southern Europe and in the mountainous parts of northern Africa. The colors of the blossoms in this genus vary from pure white to yellow, deep purple, and ruby or scarlet. Some species are propagated by young cuttings, or by layers; others by grafting the year-old shoots in spring on the roots of common species, or they may be raised from seed in any light soil. Numerous hybrid and otherwise improved varieties are in cultivation. A serious disease affecting clematis is due to attacks of nematode worms on the roots. The disease seems worst in houses and along protected walls. Fresh soil, or soil in which the worms are killed by heat or cold, is about the only remedy.

CLÉMENCEAU, klám'än'só', GEORGES BENJAMIN EUGÈNE (1841—). A French politician, born at Vendéc, in the Department of Vendée, September 28, 1841. While studying medicine in Paris, Clémenceau engaged in political intrigues, and his extreme republican views cost him his privileges as a student. He went abroad for some time, and paid a short visit to the United States. On his return to France in 1869, he finished his medical course and began the practice of his profession.

There he acquired great political influence, and after the fall of the Empire was chosen mayor of the Eighteenth Arrondissement (Buttes-Montmartre), and member of the Commission of Education. In 1871 he was elected to the National Assembly, where he voted throughout with the Extreme Left. During the stormy period of the Commune, Clémenceau acted with moderation and good sense. After unavailing efforts to bring about a reconciliation between the Government and the Commune, he resigned his office of mayor, and gave up his seat in the Assembly. In July, 1871, he was elected to the Municipal Council, and rose to be president of that body; in 1876 he became a member of the Chamber of Deputies, and soon acquired considerable prominence as the leader of the Extreme Left, and the opponent, successively, of Gambetta, Ferry, and the Boulangists. The Panama disclosures of 1892 had a damaging effect on Clémenceau's political reputation, and he lost his seat in the Chamber. For the last ten years he has figured more as a journalist than as a politician, devoting himself mainly to the editing of the radical journal *La Justice*, founded by him in 1880. He published *Les massacres d'Arménie* (1896); "L'iniquité," "Contre la justice," and "Vers la réparation" (1899-1900), reprints of articles in *L'Aurore* on the Dreyfus Affair, championing Dreyfus; and also several works of fiction and one or two social studies. In 1902 he was elected a member of the Senate. Consult Pelletan. *Célébrités contemporaines* (2 vols., Paris, 1888).

CLEMENS, klém'enz, JEREMIAH (1814-65). An American lawyer and politician. He was born at Huntsville, Ala., and graduated at the University of Alabama in 1833. He was admitted to the bar in 1834; served for several terms in the State Legislature, and distinguished himself in the Mexican War. He was United States Senator from 1849 to 1853; was Presidential Elector in 1856, and during the Civil War accepted office under the Confederacy, though he never favored secession. In 1864 he became a Unionist, and advocated the reelection of Lincoln. He was the author of several novels, including *The Rivals: A Tale of the Times of Aaron Burr and Alexander Hamilton* (1859); and *Tobias Wilson: A Tale of the Great Rebellion* (1865).

CLEMENS, SAMUEL LANGHORNE (1835—). An American novelist and humorist, better known as 'Mark Twain'—a name derived from calls used in taking soundings on the Mississippi, and first employed by Mr. Clemens in newspaper work in 1863. It had previously been taken as a pen-name by Capt. Isaiah Sellers, in the New Orleans *Picayune*. Mr. Clemens was born at Florida, Mo., November 30, 1835. He received the common-school education of a frontier town, entered a printing-office in 1848, and, becoming an expert compositor, worked at this trade in Saint Louis, New York, and other cities. In 1851 he gave up printing, and became a steam-boat pilot on the Mississippi, accumulating a fund of experience that he was later to turn to unique literary account. The Civil War closed this livelihood to him. He joined a volunteer squad of Confederate sympathizers, remaining with the command for a few weeks, but seeing no active service. Then he went to Nevada with his brother, who had been appointed Territorial

Secretary, and at Virginia City became a reporter and staff writer for the *Territorial Enterprise*, revealing here first to the public his powers of humorously exaggerated description and sarcastic wit. From Nevada he followed the trend to San Francisco, tried mining in Calaveras County, made a voyage to the Sandwich Islands, and attracted attention as a humorous lecturer and writer of localized fiction. The success of his lectures and a book called by the name of the first story, *The Jumping Frog of Calaveras County* (1867), led to his participating, with journalistic intent, in an excursion to the Orient. His letters about his trip, in revised form, became the well-known *Innocents Abroad* (1869), which won him fame on both continents. Then for two years (1869-71) Clemens edited the *Buffalo Express*. In 1872 he gathered reminiscences of far-Western life in *Roughing It*. He moved to Hartford and became a frequent contributor to magazines and journals, chiefly in a vein of exaggerated humor. His next book was *The Gilded Age* (1873), written in collaboration with Charles Dudley Warner, and afterwards successfully dramatized. Then came *The Adventures of Tom Sawyer* (1876). A second trip to Europe furnished material for *A Tramp Abroad* (1880); then followed *The Stolen White Elephant* (1882); *The Prince and the Pauper* (1882), an historical romance; *Life on the Mississippi* (1883); and *Huckleberry Finn* (1885). In 1884 he engaged in the publishing enterprise of Charles L. Webster and Company, the failure of which, about a decade later, led him to make a lecture tour around the world (1895-96), by means of which he reestablished his fortune and more than cleared his commercial honor. For ten years after 1890, Mr. Clemens lived chiefly in Europe. During this period he published *A Connecticut Yankee at King Arthur's Court* (1889); *The American Claimant* (1892); *Merry Tales* (1892); *The £1,000,000 Bank Note* (1893); *The Tragedy of Pudd'nhead Wilson* (1894); *Tom Sawyer Abroad* (1894); *Personal Recollections of Joan of Arc* (1896); *More Tramps Abroad* (1897); *Following the Equator* (1897); *The Man that Corrupted Hadleyburg* (1900); and since his return to America *A Double-Barreled Detective Story* (1902). A uniform edition of his works is issued by the Harpers. Although popularly known as a humorist, Mr. Clemens has a thoroughly serious side to his character, as has been shown by his discussion of political questions. He is also gifted with literary acumen, as he showed in a review of Professor Dowden's *Life of Shelley*, and in other papers subsequently collected in book form. But his best, and perhaps his most permanent work, has been done as a picaresque novelist in the *Adventures of Tom Sawyer* and the *Adventures of Huckleberry Finn*. No other writer has so vividly portrayed the irresponsible American boy, or so given his readers an adequate impression of the large, homely, spontaneous life led by native Americans in the great Valley of the Mississippi.

CLEMENS, klēmēnz, TITUS FLAVIUS. See CLEMENT OF ALEXANDRIA.

CLEMENT (Lat. *clemens*, merciful, Gk. κλήμης, klēmēs). The name of fourteen popes. CLEMENT I., commonly known, in historical theology, as 'Clement of Rome,' is probably not identical with the Clement mentioned in Phil. iv. 3. After

the Apostles, however, no one stood in higher honor among the early Christians; in fact, he is sometimes, as by Clement of Alexandria, called an 'apostle.' In the lists of bishops which began to be produced in the latter half of the second century, Clement stands third from Peter in the Roman succession—the best order being Linus, Anacletus, Clement. The provisional dates assigned to him by the best modern historians are A.D. 88-97; but there is much uncertainty about them. According to Jerome, Clement lived until the third year of Trajan (A.D. 101). His Epistle may be dated with high probability in the year 95 or 96. It was written in the name of the church in Rome to that in Corinth, and contains fraternal advice and counsel in view of disturbances which had arisen in the latter church. It is an important source for the history of Primitive Christianity. It was for a long time honored as 'Scripture,' and read in public worship as late as the fourth century. The other documents which bear Clement's name are not from him. What is known as II. Clement appears to be a second-century homily, of unknown origin. Several spurious epistles are attributed to him, besides the pseudo-Clementine 'Recognitions and Homilies,' on which see CLEMENTINA. Consult: J. B. Lightfoot, *The Apostolic Fathers*, part i.; *Saint Clement of Rome* (London, 1890); Knopf, *Der erste Clemensbrief* (Leipzig, 1899); Gregg, *The Epistle of Saint Clement, Bishop of Rome* (London, 1899); Krüger, *History of Early Christian Literature* (New York, 1897); Harnack, *Chronologie der altchristlichen Litteratur* (Leipzig, 1897); Brüll, *Der erste Brief des Clemens von Rom an die Corinthier* (Freiburg, 1883).—CLEMENT II., Pope 1046-47. He was a Saxon, Suidger by name, and Bishop of Bamberg. The Emperor Henry III., whose Chancellor he had been, made him Pope on the setting aside of the three rival claimants, Benedict IX., Gregory VI., and Sylvester III.; and he crowned Henry the next day. He was a determined opponent of simony, against which he held a synod a few months before his death.—CLEMENT III., Pope 1187-91. He was a Roman by birth, and Cardinal-Bishop of Palestrina. He settled some of the troubles between the Popes and the Roman people, incited Philip Augustus and Henry II. of England to undertake the Third Crusade, and in 1188 made the Scottish Church directly dependent upon Rome, removing it from the jurisdiction of the archbishops of York. The title of CLEMENT III. was also assumed by Wibert (Guibert), Antipope from 1080 to 1099 (died 1100).—CLEMENT IV., Pope 1265-68. Gui Foulquois le Gros, born at Saint Gilles, on the Rhône, of a noble Provençal family, at first a soldier, later Archbishop of Narbonne and Cardinal-Bishop of Sabina. He supported Charles of Anjou in his claim to the crown of the Two Sicilies, against Manfred, the natural son of the Emperor Frederick II. He was a man of austere piety, and set his face steadfastly against nepotism. He encouraged and protected Roger Bacon.—CLEMENT V., Pope 1305-14. Bertrand de Goth, Archbishop of Bordeaux. He was strongly under the influence of Philip the Fair, at whose bidding he suppressed the Order of Templars (see **TEMPLAR KNIGHTS**), and was the first of the Popes to reside at Avignon, which continued to be the seat of the Papacy for nearly

seventy years. Consult Rabanis, *Clément V. et Philippe le Bel* (Paris, 1858); Lacoste, *Nouvelles études sur Clément V.* (Bordeaux, 1896).—CLEMENT VI., Pope 1312-52. Pierre Roger, Archbishop of Rouen, and like his three predecessors a Frenchman. He too was entirely under French influence, and refused to return from Avignon to Rome, in spite of a formal invitation delivered by a delegation headed by Petrarch. He excommunicated the Emperor Louis of Bavaria, and compelled him to submit to the most humiliating conditions. As suzerain of the Kingdom of Naples, he acquitted Queen Joanna of the murder of her husband, and purchased the territory of Avignon from her for 80,000 crowns. He maintained the ecclesiastical jurisdiction against the encroachments of Edward III. of England, and made some negotiations for a reunion with the Eastern Church. He lived in great splendor, and contributed largely to the beautifying of the Avignon residence.—CLEMENT VII., Pope 1523-34. Giulio de' Medici, born about 1475. Before his elevation, he had acquired some reputation for capacity in affairs which the unfortunate events of his pontificate showed to have been ill-founded. His worldliness and lack of insight into the tendencies of the age disqualified him from comprehending the great upheaval which threatened the Church, while his timidity and indecision no less disabled him from following a consistent policy in secular affairs. He was at first attached to the Imperial interest, but by the overwhelming success of the Emperor Charles V. in the battle of Pavia was terrified into joining the other Italian powers in a league with France. But his zeal was soon cooled, and by want of foresight and unreasonable economy he laid himself open to an attack from the turbulent Roman nobles, which obliged him to invoke the mediation of the Emperor. When this danger seemed past, he veered back to his former engagements, and ended by drawing upon himself the army of the Constable de Bourbon. On May 6, 1527, followed the memorable and terrible sack of Rome by the Imperial troops. The Pope retired to the Castle of Sant' Angelo, where he was kept a prisoner for over six months. He was released upon very onerous conditions, and fled immediately to Orvieto. The following year he returned to Rome, and in 1529 he made his peace with Charles V., who undertook to assist in the restoration of the Medici in Florence, and whom the Pope crowned at Bologna in 1530. For several years Clement followed a policy of subservency to the Emperor, on the one hand endeavoring to induce him to act with severity against the Lutherans of Germany, and on the other striving to elude his demand for a general council. The loss of half of Germany to the Church, and the breach with England, occasioned by the Pope's refusal to sanction the divorce of Henry VIII., made this a most unfortunate pontificate. Consult: De' Rossi *Memorie storiche del pontificato di Clemente VII.* (Rome, 1837). The title of CLEMENT VII. was also assumed by Robert of Geneva, Antipope (see ANTIPOPE), 1378-94.—CLEMENT VIII., Pope 1592-1605. Ippolito Aldobrandini, born about 1536. He brought about the reconciliation of Henry IV. of France with the Church (1593), and, on the extinction of the male line of the house of Este, annexed Ferrara, the last addition of importance to the States of the Church. He acted as medi-

ator in the negotiations which resulted in the Peace of Vervins. The last years of his pontificate were occupied, among other important questions, by the controversy between the Jesuits and Dominicans on the question of grace, which led him to establish in 1597 the celebrated *Congregatio de Auxiliis Divine Gratie*. He was a man of marked piety; he confessed daily to Saint Philip Neri, and after the latter's death to his successor in the headship of the Oratorians, Cardinal Baronius. His love for letters was shown by his promotion of a number of learned scholars to the purple, and the issue of revised editions of the Vulgate, the breviary, and the liturgical books. The title CLEMENT VIII. was also assumed by Egidius Nuñez, Antipope, 1425-29.—CLEMENT IX., Pope 1667-69. Giulio Rospigliosi. He was born in 1600 and studied in the Roman Seminary. As Nuncio to Spain, he acquired an insight into political affairs, and an influence which enabled him, after his elevation to the Papal throne, to bring about the peace of Aix-la-Chapelle (1668) between France and Spain. He endeavored to adjust the Jansenist difficulties in France, but his efforts failed to bring about a permanent peace.—CLEMENT X., Pope 1670-76. Emilio Altieri, born 1590. He was the immediate successor of Clement IX., who had made him a cardinal but a few months before his death, and with his last breath designated him as his choice for the Papal throne. In consequence of his advanced age, he left much of the government to his nephew, Cardinal Paluzzo Paluzzi.—CLEMENT XI., Pope 1700-21. Giovanni Francesco Albani, born 1649. He was employed in many important diplomatic affairs, and made cardinal a few months before his election to the Papacy. His pontificate was troubled by many disputes, with Prussia, with the Empire, and with the recalcitrant Jansenists in France, against whom he launched the famous constitutions *Vincam Domini Sabaoth* (1705) and *Unigenitus* (1713). Another important decision by this Pope forbade the Jesuit missionaries in China to employ certain native ceremonial forms in China and India which they had adopted in their mission work to overcome native prejudices.—CLEMENT XII., Pope 1730-40. Lorenzo Corsini, born 1652, made cardinal 1706. He was more distinguished as a wise and kind-hearted temporal sovereign, who did much for both art and industry in his dominions, than as a great international power. In 1738 he condemned the Freemasons.—CLEMENT XIII., Pope 1758-69. Carlo Rezzonico, born 1693; made cardinal 1737, on the recommendation of Venice, his native State. His reign was occupied with unceasing struggles for the rights of the Church, and for the preservation of their ardent champions, the Jesuits, against the liberalizing governments of his day, such as those controlled by Pombal in Portugal and Choiseul and Madame de Pompadour in France. He witnessed, however, the expulsion of the Jesuits from Portugal, France, and Spain. It was believed that he was about to yield to the demand for the suppression of the Order, when he died, leaving these thorny questions to his successor, Clement XIV.—CLEMENT XIV., Pope 1769-74. Giovanni Vincenzo Antonio Ganganelli, born 1705 at Sant' Arcangelo, near Rimini, where his father was a physician. At the age of eighteen he entered the Order of Minorites, and studied philosophy and theology,

which he afterwards successfully taught. His merits were appreciated by the keen-sighted Benedict XIV., who appointed him to the important post of counselor to the Inquisition, and under Clement XIII. he was made a cardinal. No Pope had ever confronted greater difficulties on his accession. The kings of Portugal, France, Spain, and Naples were at variance with him, chiefly on account of his support of the Jesuits; Venice wished to reform the religious orders without his interference; Poland was seeking to diminish his influence; the Romans themselves were discontented. He first set about reconciling the monarchs; he sent a nuncio to Lisbon, suspended the bull *In Cena Domini*, and entered into negotiations with Spain and France. After several years of negotiation he signed, on July 21, 1773, the famous brief *Dominus ac Redemptor noster*, suppressing the society of the Jesuits. The motive assigned in the brief is, "regard to the peace of the Church." From this time he showed signs of constant inquietude and uncertainty as to whether he had acted rightly in this grave matter, and his strength gradually gave way. He died of a scorbutic disease, September 22, 1774. Clement XIV. was remarkable for liberality of mind, address as a statesman, sound learning, and mildness of character. He cherished the arts and sciences, and was the founder of the Clementine Museum, which, by the additions of Pius VI. and Pius VII., became the chief ornament of the Vatican. Consult: A. Theiner, *Geschichte des Pontificats Clement XIV.* (Paris, 1853); Von Remmont, *Ganganelli (Pope Clement XIV.), seine Briefe und seine Zeit* (Berlin, 1847); Ravignan, *Clément XIII. et Clément XIV.* (Paris, 1854).

CLEMENT OF ALEXANDRIA (Lat. *Clemens Alexandrinus*, Gk. Κλήμης Ἀλεξανδρείος, *Klēmēs Alexandreios*) (c.150-c.215). Titus Flavius Clemens, a celebrated Greek father of the Church. He was probably of heathen parentage, and his birthplace is unknown. He received a liberal education, and sought out many teachers in his search for truth. He finally resorted to the Christian Pantænus, who presided over the catechetical school at Alexandria, and here he entered the Church. He was ordained a presbyter, and succeeded Pantænus as head of the famous school, which was destined to achieve much greater renown because of the influence of his own and Origen's teaching. During the persecution in the reign of Septimius Severus (c.203 A.D.), Clement left Alexandria. We hear of him afterwards in Palestine and Asia Minor; but his later life is veiled in obscurity, and we know neither the place nor the date of his death.

Clement was a man of wide learning, and was proficient in Greek philosophy, literature, and history. Jerome called him 'the most learned of men;' but this is mere friendly exaggeration. As a theologian he ranks high, although inferior to his famous pupil, Origen (q.v.). According to his system, the divine Logos exhorts, educates, and perfects the true Christian gnostic, through a gradual process which is marked out, in three stages, in Clement's chief works—the *Exhortation to the Greeks*, the *Instructor*, and the *Stromata* ('miscellaneous'), which together form a kind of trilogy. The first is a defense of the faith, designed to win converts. The second contains instructions in manners and morals for

every-day life. In this Clement has not hesitated to draw freely from Stoic sources. The third is an unsystematic discussion of various points of doctrinal theology, designed to guide the mature Christian to a perfect knowledge (gnosis). Appended to the *Stromata* is one of the earliest Christian hymns, familiar to the modern world in the version beginning, "Shepherd of tender youth." Of Clement's other writings the best known is the tractate, *Who is the Rich Man that Shall be Saved?* In his interpretation of Scripture Clement followed the allegorical method, so much in vogue in Alexandria. The best edition of Clement's works is by Potter (Oxford, 1715), reprinted in Migne's *Patrol. Græc.*, viii. and ix. (Paris, 1857).

An English translation may be found in the *Ante-Nicene Fathers*, vol. ii., ed. by A. C. Coxe (New York, 1885). Consult in general, the article "Clement," in Smith and Wace, *Dictionary of Christian Biography* (London, 1877-87); Charles Bigg, *The Christian Platonists of Alexandria* (Oxford, 1886); F. R. M. Hitchcock, *Clement of Alexandria* (London, 1899); and Eugène de Faye, *Clément d'Alexandrie* (Paris, 1898).

CLÉMENT, klá'mäx', JACQUES (c.1567-89). The assassin of Henry III. of France. He was born at Sorbon, in the Department of Ardennes, and in early life seems to have been a soldier. Later he entered a Dominican convent in Paris. Ignorant, passionate, and probably also demented, Clément became a fanatic partisan of the League in its struggle against the French King and Henry of Navarre. After the murder of the Duke of Guise and his brother, at Blois, in 1588, Clément began to think of himself as the instrument selected by Heaven to overthrow the "tyrant," that is, Henry of Valois, and to avenge the death of the two great leaders of the League. He is said to have confided his plan to assassinate the King to Bourgoing, the prior of his convent, and to have received the latter's approbation. It is asserted also by historians friendly to the cause of Henry of Navarre that the plan was brought to the knowledge of the Cardinal of Mayenne and his sister, the Duchesse de Montpensier, and that it was, in fact, carried out with their assistance; but historians friendly to the League deny that its leaders had any previous knowledge whatever of Clément's murderous scheme. Letters of introduction to the King were obtained for Clément from the president, Harlay, and the Count de Brienne, who were then prisoners of the League in Paris. On July 31, 1589, Clément set out for Saint Cloud, from where Henry III. was directing the operations against the capital. On the morning of August 1, he was admitted to the presence of the King as the bearer of an important letter, and while the King was reading it, stabbed him. Henry threw the knife into the assassin's face, exclaiming: "Oh! the wicked monk; he has killed me! Put him to death!" Clément was immediately cut down and his body was subsequently quartered and burned. The King died the next day. By the zealots among the Leaguers, the deed was received with undisguised rejoicing, and according to Daubigné, a Protestant, the act of Clément was praised from the pulpit, and the monk declared a martyr. De Thou, a partisan of Henry IV., asserts that Pope Sixtus V. lauded Clément, but both Daubigné's and de Thou's statements

have no authority beyond their own assertion. For a defense of the assassination of Henry III., consult Pinsolot, *Le martyre du frère Jacques Clément* (Paris, 1589).

CLÉMENT, JEAN PIERRE (1809-70). A French political economist and historian, born at Draguignan. He was an official in the Ministry of Finance, and wrote, with the aid of original documents, a number of authoritative works on finance, particularly French financial administration. These include: *Histoire de la vie et de l'administration de Colbert* (1846); *Histoire du système protecteur en France depuis Colbert jusqu'à la révolution de 1848* (1854); and *Etudes financières et d'économie sociale* (1859).

CLEM'ENT, JUSTICE. An 'old merry magistrate' in Jonson's *Every Man in His Humour*, who threatens Cob with jail because "he depraves and abuses an herb so generally received into the courts of princes"—i.e. tobacco.

CLEMENTI, klā-mēn'tē, JACOPO DI, DA EMPOLI (often called CHIMENTI) (1554-1640). An Italian painter of the Florentine school, born at Empoli. He was a pupil of Tommaso di San Friano (or Tridano), and was influenced by the works of Andrea del Sarto and other Florentine masters. In his own canvases his manner is severe to rigidity, his treatment often realistic, and his color pleasing. Among his chief paintings are "Christ in Gethsemane," in the Prado Museum, Madrid; "Saint Ives," and the "Sacrifice of Isaac" in the Uffizi Gallery, Florence. He was also a painter of still life.

CLEMENTI, klā-mēn'tē, MUZIO (1752-1832). An Italian piano virtuoso and composer, born in Rome. His father, a goldsmith and fervent music-lover, placed him under a relative, Baroni, for lessons in piano and harmony, and in 1761 Clementi became an organist. Later on, Carpani taught him counterpoint; and Sartarelli, singing. In 1766 an Englishman, Beckford, delighted with his playing, took him to England, where he continued his musical studies until 1770. He was now a finished virtuoso, and published three piano sonatas (Op. 2)—the first works of this kind that bear the modern form. His success as a performer in London was extraordinary, and in 1777-80 he was cembalist (conductor) at the Italian opera there. His first tour (1781) included Strassburg, Munich, and Vienna, where his public contest with Mozart became an historic event, though the palm was awarded to neither. He aroused great enthusiasm in Paris (1785), but, in spite of it, decided to enter business. He returned to London, secured an interest in the publishing and piano-manufacturing firm of Longman & Broderip, and after its failure formed a partnership with Collard. The mechanical perfection of the piano absorbed most of his energies, yet he found time to write theoretical works, and to give instruction—a field in which he had no rival. His concert tours in Russia (1802), and afterwards in Germany and Italy, were wonderfully successful; but his enterprises in London, by which he amassed a fortune, claimed most of his attention. He retired in old age to his estate at Evesham, near London, and died there March 10, 1832. Among Clementi's pupils, Field, Cramer, Moscheles, Kalkbrenner, and Meyerbeer are the most noteworthy. Even Beethoven owes much to Clementi in his works for the piano. His style as a performer was that

of a virtuoso, characterized by polish, vigor, and brilliancy, and a beautiful singing tone; and he especially excelled in improvisation. Of his works the sonatas are brilliant and melodious, while his series of exercises, *Gradus ad Parnasum* (1817), remains an indispensable work in every pianist's equipment. Consult: Ferris, *Great Violinists and Pianists* (New York, 1894); Shedlock, *The Pianoforte Sonata* (London, 1895); Frojo, *Muzio Clementi, la sua vita, le sue opere e sua influenza sul progresso dell' arte* (Milan, 1878).

CLEM'ENTINA, or PSEUDO-CLEMEN-TINE (sū'dō-klēm'en-tin) **WRITINGS** (Lat. nom. pl., from Gk. Κλημέντια, *klēmēntia*, from Lat. *Clemens*, Clement). A collection of discourses and stories, bearing the name of Clement of Rome (q.v.), of uncertain authorship and date, but in their present form not earlier than the beginning of the third century. The first external testimony to their existence is found in the writings of Origen (died c.254). The groundwork upon which the compilation rests may, perhaps, date from the second century. The pseudo-Clementine literature includes twenty *Homilies*, ten *Recognitions*, and an *Epitome*, which were all written in Greek. The last is relatively unimportant. In the *Homilies* and *Recognitions* we have what purports to be the story of Clement's career, in company with his teacher, the Apostle Peter. The bulk of the narrative consists of an unsystematic and frequently interrupted account of the experiences of Peter with the arch-heretic Simon Magus, with whom he carries on doctrinal and ethical discussions, and whom he victoriously follows from place to place, founding churches on the way.

The theological position of the writer is clearly discernible. He is a Jewish Christian Gnostic, perhaps of the sect of Elkesaites (q.v.). He ignores (some would say, opposes) Paul, and exalts the person of James, "the Lord's brother." It is for the sake of the teaching contained, rather than for the sake of any historical narration, that the *Clementina* exist. This purpose appears most plainly in the *Homilies*. The *Recognitions* traverse the same general ground, but with variation of treatment and with greater attention to the events themselves. Historical criticism has not yet reached definite conclusions on all the problems presented by these curious writings. That there has been more or less working over of earlier material is generally conceded. Recent opinion inclines toward Syria as the probable home of the work on which the writings are based (Uhlhorn), and toward Rome as a possible source for the books in their present form (Harnack). But we have thus far no means of constructing even a plausible hypothesis as to the person or persons by whom they were recast.

BIBLIOGRAPHY. Among editions of the pseudo-Clementine writings may be mentioned: the edition of the *Homilies* by Lagarde (Leipzig, 1865); of the *Recognitions* by Gersdorf (Leipzig, 1838); of the *Epitome* by Dressel (Leipzig, 1859); Eng. trans. in the *Ante-Nicene Fathers*, ed. by A. C. Coxe, vol. viii. Consult, in general: G. Krüger, *History of Early Christian Literature* (Eng. trans., New York, 1897); Harnack, *Geschichte der altchristlichen Litteratur*, i. (Leipzig, 1893); C. Bigg, *The Clementine Homi-*

lies, in *Studia Biblica et Ecclesiastica*, ii. (Oxford, 1890).

CLEMENTINA, klā'mēn-tē'nā, LADY. In Richardson's novel *Sir Charles Grandison*, an Italian infatuated with Sir Charles.

CLEMENTINES (Lat. *Clementinæ*, se. *leges*, laws, from *Clemens*, Clement). A collection of Papal decrees and constitutions published by Pope Clement V. in 1313. They constitute five books and 52 titles in the *Corpus Juris Canonici*, and were separately edited and published by the Benedictines in 9 vols., with an appendix (1885-92).

CLEMENT'S INN. An Inn of Chancery, attached to the Inner Temple, in London. It received its name from the neighboring Saint Clement's Well, and originally served as a place of entertainment for those who made use of the waters. *Master Shallow*, in Shakespeare's *Henry IV., Part II.*, tells of an event happening "before I came to Clement's Inn."

CLEOBULUS (Lat., from Gk. Κλεόβουλος, *Kleoboulos*). One of the Seven Wise Men of Greece. He was the son of Evagoras, and a native of Lindus, in Rhodes, over which town he was ruler. He lived between B.C. 628 and 558, and was perhaps the first to give a literary form to riddles, in which line he was followed by his daughter, Cleobuline. He also wrote lyric poetry. Diogenes Laërtius ascribes to him a riddle on the year, the epitaph on the tomb of Midas, and a letter to Solon, all of which Diogenes has preserved for us. Consult Bergk, *Poeta Lyrici Græci* (Leipzig, 1900).

CLE'OFAS, DON. The Spanish student for whose benefit Asinodens exposes to view the secret life of all Madrid by unroofing the houses, in Le Sage's *Le diable boiteux*.

CLÉOMADÈS, klā'ō'mā'dēs', THE ADVENTURES OF (Fr., *Les aventures de Cléomadès*). A French poem, of some 20,000 lines, written by Adenès le Roi, toward the close of the thirteenth century. Its plot is built upon the phenomenon of a wooden horse capable of transporting its rider to any destination.

CLEOM'BROTUS I. (Lat., from Gk. Κλεομβροτος, *Kleombrotos*) (? -371 B.C.). A king of Sparta (B.C. 380-71). He was a son of Pausanias and succeeded his brother, Agesipolis I. He commanded the Spartan army which was sent against Thebes in B.C. 378, and which returned home without accomplishing anything; and two years later he led into Bœotia a second equally unsuccessful expedition. He was defeated and killed in the battle of Leuctra (B.C. 371).

CLEOMEDES, klē'ō-mē'dēs (Lat., from Gk. Κλεομήδης, *Kleomēdēs*). A Greek writer on astronomy of the first or second century A.D. After the manner of the later Stoics, he devoted himself to the study of meteorology and astronomy, and composed a treatise, *The Circular Theory of the Heavenly Bodies* (Κυκλική θεωρία τῶν μετεώρων, *Kyklikē theōria tōn metēōrōn*), which contains many truths of modern science—the spherical shape of the earth, the revolution of the moon about the earth, etc. The best edition is that by Ziegler (1891).

CLEOMENES (klē-ōm'ē-nēs) I. (Lat., from Gk. Κλεομένης, *Kleomenēs*). A king of Sparta. He was the son of Anaxandrides, and came to the

throne not later than B.C. 518 or 517. In compliance with the mandate of the Delphic Oracle, he in B.C. 510 assisted the Athenians in expelling from their city Hippias, the last of the Pisistratidæ. Shortly after this event, he joined Isagoras, the head of the Oligarchical Party at Athens, in an attempt to overturn the Clisthenian Constitution. Clisthenes was driven from the city, and seven hundred families, partisans of Clisthenes, were sent into exile; but the undertaking, as a whole, proved unsuccessful. Later he made another attempt to aid Isagoras, but again without success. At the time of the Ionic revolt, he was appealed to in vain by Aristagoras to join the Grecian cause. In the war which broke out between Sparta and Argos, about the time of the capture of Miletus by the Persians, Cleomenes, having by a piece of stratagem defeated the Argives near Tiryns, treacherously slew a number of the survivors, and destroyed the rest by setting fire to the grove in which they had taken refuge. No fewer than six thousand Argive citizens perished at this time, in and after the battle. On his return to Sparta, Cleomenes was impeached for not having attacked Argos, but was acquitted. He afterwards, by bribing the Delphic Oracle, secured the dethronement of his colleague, Demaratus, and in his later years became insane, finally taking his own life.

CLEOMENES III. (? -219 B.C.). A king of Sparta. He was the son of Leonidas II, and the last of the Agidæ. He became King about B.C. 235. Cleomenes was the inheritor of the aspirations of King Agis IV.; his aim was to do away with the ephorate at Sparta, and reassert the power of the kings, and then to raise Sparta to the position of leader in Greece. The furtherance of his plans brought him into opposition to the Achæan League. War broke out between Sparta and the League in B.C. 227, and in the following year Cleomenes twice defeated the Achæans in battle—once at the foot of Mount Lyeæus, in Arcadia, and a second time at Leuctra, in the territory of Megalopolis. After this he proceeded to introduce his changes in the Spartan Constitution; he abolished the ephorate, restored the prerogatives of the kings, made a redistribution of the lands, and extended the franchise. In the year B.C. 224 he utterly defeated the Achæans in a battle at Dyme, near Hecatombræum, but in B.C. 221 was himself defeated at Sellasia by the combined forces of the Macedonians and Achæans, under the command of Antigonus and Philipemen. Fleeing to Egypt, he there later endeavored to head an insurrection of the people, but, failing in that, took his own life. Cleomenes was the last great statesman that Greece produced.

CLEOMENES, OR THE SPARTAN HERO. A play by Dryden and Southerne, produced in May, 1692. The title character is an exiled monarch, who seeks the assistance of a foreign ruler to restore him to his throne. The subject caused some opposition to the presentation of the play, as it was thought to have a disagreeable Jacobite significance.

CLE'ON. The governor of Tharsus, in Shakespeare's *Pericles*, who, with his wife, is hurried to death for planning the murder of Marina, daughter of Pericles.

CLEON (Lat., from Gk. Κλέων, *Kleōn*) (? -422 B.C.). An Athenian demagogue, who

lived in the early part of the Peloponnesian War. He was a son of Cleonetus, and was by trade a leather-dealer. He first came into prominence as a public speaker who was opposed to the policy of Pericles; and in B.C. 427, when the matter of the treatment of the inhabitants of Mytilene came up for consideration in the Athenian Assembly, he advocated the utmost severity tolerated by custom of war. In B.C. 425, when envoys arrived at Athens to treat of the release of the Spartan citizens shut up on the island of Sphacteria and to suggest peace, the Athenians, instigated by Cleon, imposed such terms upon Sparta that peace was found to be impossible. Later in the same year, owing to a casual remark made in the public assembly to the effect that, if he were general, the Athenians would not long remain in front of Sphacteria, Cleon himself was placed in charge of the operations against the island. He promised to end the siege within twenty days; and, in conjunction with Demosthenes, he did this. In B.C. 422 Cleon was sent to oppose Brasidas, the Spartan general, in Macedonia and Thrace, and to recover the city of Amphipolis. He was successful in taking the towns of Torone and Galepsus, but was defeated and slain in the battle which took place beneath the walls of Amphipolis. Cleon is described by Thucydides and Aristophanes as an insolent and venal politician, and a demagogue of low type. It is generally admitted that some of the details of Aristophanes's picture may be out of proportion; but whether Thucydides's estimate of Cleon's character is a thoroughly just and unprejudiced one is a mooted question. Cleon was a persuasive speaker, a clever hand at managing public business in a popular way, and a strong advocate of war. Consult Grote, *History of Greece*, vol. vi. (London, 1888).

CLÉONTE, κλέωντ'. A character in Molière's *Le bourgeois gentilhomme*, in love with Lucille.

CLEOPATRA (Gk. Κλεοπάτρα). The name of several queens and princesses of Egypt of the family of the Ptolemies (q.v.). The most famous of them, **CLEOPATRA VI.**, daughter of Ptolemy XIII., Auletes, was born in B.C. 69 or 68. Her father died in 51, leaving a will wherein he appointed as his successors his elder daughter, Cleopatra, and his elder son, Ptolemy, and requested the Roman people to see his testamentary dispositions carried into effect. The will was duly ratified by the Roman Senate, and Cleopatra, then about seventeen years old, and her brother, Ptolemy XIV., a child of about twelve years, succeeded jointly to the throne of Egypt, with the understanding that they should shortly marry. In the third year of their reign, Ptolemy, urged by his advisers, assumed sole control of the government and drove his sister into exile. She promptly gathered an army in Syria, and prepared to assert her claims. It was at this time that Pompey, seeking refuge with the King of Egypt, after his defeat at Pharsalia, was murdered by the King's advisers. Cleopatra seems to have been unable to make good her claim by force of arms; but, shortly after Pompey's death, Cæsar arrived at Alexandria and, yielding to the fascinations of the Egyptian Queen, became her lover and espoused her cause. He was for a time hard pressed by the Egyptians, but ultimately triumphed and Ptolemy lost his life. Arsinoë, the younger daughter of Ptolemy Auletes, was

carried off to grace Cæsar's triumph at Rome. Cleopatra now nominally married her younger brother, Ptolemy XV., and, after settling their joint government upon a secure basis, went to Rome, where she lived as Cæsar's mistress until his assassination in B.C. 44. After Cæsar's death, having, it is said, poisoned her brother, Ptolemy XV., she returned to Egypt, where she associated with her on the throne her son by Cæsar, called Cæsarion. In the civil war following Cæsar's death, Cleopatra having hesitated to take sides with either party, Antony, after the battle of Philippi (42), summoned her to meet him at Tarsus in Cilicia to explain her conduct. When she appeared upon the Cydnus on a splendidly adorned vessel, in the garb of the goddess Aphrodite, the Roman triumvir fell a victim to her charms, and returned with her to Egypt. After living with her for some time, in the course of which she bore him twin children, Antony was compelled to return to Rome, where he married Octavia, a sister of Octavius. When, in 36, he went to the East in command of an expedition against the Parthians, he sent for Cleopatra, and she joined him at Antioch, and after his defeat she met him in Syria with troops and supplies. In 34, after a more successful campaign against the Parthians, he celebrated his triumph at Alexandria and continued to reside in Egypt. In 32 Octavianus declared war against Cleopatra, and Antony, in revenge, divorced his wife Octavia. Against the counsel of Antony's advisers, Cleopatra insisted on taking part in the ensuing campaign. At the naval battle of Actium (31), believing Antony's defeat to be inevitable, she withdrew her fleet from action, and fled to Alexandria. Her lover, beholding her flight, made no further effort to retrieve his fortunes, but retired from the battle and followed her. On the approach of Octavianus, Antony, deceived by the false report of the Queen's death, fell by his own hand. Cleopatra made some attempts to bring Octavianus under the influence of her charms, but, failing in this, and hearing that he intended to exhibit her in his triumph at Rome, she killed herself (B.C. 30), probably by poison, and according to an old tradition, by the bite of a venomous serpent. Cleopatra combined rare intellectual gifts with physical charms, and she is immortal as one of the most fascinating women of all time; so that ever since her death, she has been a constant theme for artists, dramatists, and poets. There is no authentic portrait of Cleopatra extant, except in her effigy upon coins. A composite photograph has been made of these by Goringe in his book *Egyptian Obelisks* (New York, 1865).

Cæsarion, her son by Cæsar, was put to death by Octavius. Of her three children by Antony, her daughter **CLEOPATRA** married Juba, King of Mauretania, who was allowed by Octavius to take under his protection his wife's two brothers, Alexander and Ptolemy. In A.D. 40, Ptolemy, son of Juba and the younger Cleopatra, was slain by Caligula, and with him ended the line of the Ptolemies. (See **PTOLEMY**.) Consult: Strack, *Die Dynastie der Ptolemäer* (1896); Mahaffy, *The Empire of the Ptolemies and History of Egypt Under the Ptolemæic Dynasty* (1899); Lombroso, *L'Egitto dei Greci e dei Romani* (1895).

CLEOPATRA'S NEEDLES. The name given to two Egyptian obelisks of red syenite, which

were transported from Heliopolis to Alexandria about the year B.C. 14, and remained there until 1877, when they were presented to the governments of Great Britain and the United States by the Khedive Ismail Pasha. Of the two companion monoliths, one now stands on the Thames Embankment, London, the other in Central Park, New York. The latter is 69 feet high, with a base 7 feet 7 inches in diameter, and weighs 200 tons. It is supported on four bronze crabs, reproductions from the originals preserved in the neighboring Metropolitan Museum. The obelisk bears inscriptions of Thothmes III. (about B.C. 1500) and Rameses II. See **OBELISK**. Consult, Gorringe, *Egyptian Obelisks* (New York, 1885).

CLEPSYDRA (Gk. κλεψύδρα, *klepsydra*, from κλέπειν, *kleptein*, to steal + ὕδωρ, *hydōr*, water). An ancient instrument for measuring time by the efflux of water through a small orifice. Two kinds have been in use. In the simplest form the water was allowed to escape from one vessel into another. This form was used in the Athenian courts, where a speaker was allowed a certain number of *amphoræ* of water for his speech, the quantity depending on the importance of the suit. The more complicated form was said by some to have been invented by Plato, while others gave the honor to Ctesibius of Alexandria. In this form the water was allowed to flow at a uniform rate into a receptacle, on which was marked a scale of hours. Both forms are said to have been introduced into Rome in B.C. 159, and were widely used. Athenæus (iv. p. 174) applies the name to a variety of the hydraulic organ.

CLERC, klâr, JEAN LE. See **LE CLERC**, JEAN.

CLERC, LAURENT (1785-1869). A French deaf mute and educator, born near Lyons. He was a favorite pupil of the Abbé Sicard at the institution of the deaf and dumb founded in Paris by the Abbé de l'Épée, and after eight years of study became himself a teacher. In 1816 he came to the United States at the request of Dr. Gallaudet (q.v.), and the next year the two opened an institution for the deaf and dumb in Hartford, Conn., where Clerc successfully taught deaf-mutes for more than forty years. He married a deaf mute, who bore him several children, all of whom had the sense of hearing and could speak. See **DEAF MUTE**.

CLERESTORY. See **CLEARSTORY**.

CLERFAYT or **CLAIRFAIT**, klâr'fâ', CHARLES DE CROIX, Count (1733-1798). An Austrian field-marshal, born at the Castle of Bruille, Hainaut, Low Countries. He entered the Austrian service in 1753, fought with distinction in the Seven Years' War, and was advanced to the rank of colonel. During the Turkish war of 1787-91 he was commander of an army corps which defeated the Moslem troops at Mehadia and Kalafat. In 1792 he commanded the Austrian corps sent to the assistance of the Duke of Brunswick in the war with France, and defeated the French at Croix-aux-Bois (September 15). Having withdrawn into Belgium, he defeated the French at Aldenhoven (March 1, 1793), relieved Maastricht, decided the battle of Neerwinden (March 18), and took Le Quesnoy (September 11). After this series of brilliant victories he met with reverses at Wattignies (October 15 and 16), Mouseron (April 29, 1794), and Hoogeleele (June 13). In 1795 he was ap-

pointed field-marshal and commander-in-chief of the Imperial armies on the Rhine, in which capacity he defeated Jourdan at Hœchst (October 11), and relieved Mainz, storming the almost impregnable works of the besiegers, which were defended by an army of 80,000 men. After concluding an armistice with the French Republic, he returned to Vienna, where he was hailed as the savior of the Empire. Because of differences with the Imperial Minister Thugut, he afterwards resigned his position.

CLERGY (OF, *clergie*, Lat. *clericus*, from Gk. κληρικὸς, *klērikos*, clergyman, from κληρος, *klēros*, lot). A term very generally applied to the ministers of the Christian religion, in contradistinction to the laity (q.v.). This use of the term is very ancient, and appears to have gradually become prevalent, as the ministers of religion more and more exclusively, instead of the members of the Christian Church equally, began to be regarded as God's 'heritage' and 'priesthood' (1. Pet. ii. 9, and v. 3), consecrated to Him, and peculiarly His. The distinction between the clergy and the laity became more marked through the multiplication of offices and titles among the clergy, the ascription to them of a place in the Christian Church similar to that of the priests and Levites in the Jewish Church, with peculiar rights and privileges, their assumption of a peculiar dress and of official insignia, the growth of monastic institutions, and the introduction of celibacy. In harmony with the notions on which this distinction is founded is that of an indelible, sacramentally stamped character derived from ordination, so that a renunciation of the clerical office is either viewed as an impossibility or a sort of apostasy. These notions in their highest degree belong to the Church of Rome. In the Protestant churches the distinction between clergy and laity is much less wide; and, although the same terms are often used, it is rather conventionally than in their full signification. The employment of official robes by the clergy preceded their assumption of a peculiar ordinary dress, and is not so intimately connected with any peculiar pretensions. Among the privileges accorded to the clergy by the Roman emperors, and in the Middle Ages, was exemption from civil offices; among the rights asserted by them, and which caused much dispute, was exemption from lay jurisdiction, even in cases of felony. (See **BENEFIT OF CLERGY**.) The clergy were distinguished into the *higher* clergy and the *lower* clergy; the latter including ostiarii, acolytes, lectors, exorcists, etc. The term *secular* clergy is the designation of priests of the Church of Rome who are not of any religious order, but have the care of parishes. Monks who are in holy orders are designated *regular clergy* (from *regula*, rule). See **ORDERS**, **HOLY**; **BISHOP**; **PRIEST**; **DEACON**.

CLERGY, **BENEFIT OF**. See **BENEFIT OF CLERGY**.

CLERICUS, JOHANNES (1657-1736). See **LE CLERC**, JEAN.

CLERIDÆ. See **CHECKERED BEETLES**.

CLERK (AS, *clerc*, *cleric*, from Lat. *clericus*, clergyman). In the Middle Ages, an appellation for an ecclesiastic, extended at a later period to mean a complimentary title for men of learning, whether of the Church or not. In modern times it indicates any one who makes and keeps rec-

ords, public or private; but 'clerk in holy orders' is still in England the legal designation of a minister of the Established Church. See CLERGY; BENEFIT OF CLERGY.

CLERK, NAVAL. There are two classes of clerks in the United States Navy, called 'paymaster's clerks' and 'captain's clerks.' Both formerly were civilians, and the paymaster's clerk is still one. He is appointed at the request of the pay-officer, and serves until his appointment is revoked. While in service he wears a uniform similar to that of warrant officers, and messes with the junior officers. The pay varies from \$1000 to \$1300, according to the class of ship on which he is serving; on certain receiving-ships, and on shore, at certain navy-yards, the pay of the principal pay-clerk reaches \$1800.

CLERK, PARISH. See PARISH CLERK.

CLERKENWELL (clerks' well, Lat. *Fons Clericorum*, from its well which was a meeting-point for the parish clerks of London). A parish of London (q.v.), England, north of Saint Paul's Cathedral, between Holborn Viaduct and Islington. It is a noted district for the manufacture of metal articles, watches, and optical instruments.

CLERK-MAXWELL. See MAXWELL.

CLERMONT, klär'môn' (ML. *Clarus Mons*, fair hill, from *clarus*, clear, and *mons*, mountain). An ancient town in the Department of Oise, France, 36 miles north of Paris (Map: France, J 2). The town hall and Church of Saint Samson date from the fourteenth century, and the hill on which the town is built is surmounted by an old castle of the tenth or eleventh century, used in modern times as a penitentiary for women. Clermont was an important place in the Middle Ages. It was frequently taken and retaken in the wars with the English, and in 1487 it was surrendered to them as a ransom for the French leader La Hire. Population, in 1901, 5723.

CLERMONT-FERRAND, -fër'rân'. The capital of the Department of Puy-de-Dôme, France, 215 miles south-southeast of Paris (Map: France, K 6). It is finely situated, on a gentle elevation, between the rivers Bedat and Allier, at the foot of a range of extinct volcanoes, crowned by the peak of Puy-de-Dôme, about five miles distant from the town. It consists of the two towns of Clermont and Montferrand, connected by a fine avenue of trees. It contains several remarkable buildings; such as the old Gothic cathedral, the corn and linen hall, the theatre, and the Hôtel-Dieu or hospital, various educational and scientific institutions, and a public library, in which are over 55,000 printed volumes and 1100 manuscripts. The manufactures of the place are manifold, and include woolen and linen goods, machinery, straw hats, chocolate, and needles, while there is an extensive traffic in the produce of the district, and considerable transit trade between Paris and the south of France. There are two hot mineral springs in the town, which are used for bathing. Clermont-Ferrand is the seat of a bishop. Population, in 1896, 50,870; in 1901, 52,933. A multitude of Roman antiquities attest the antiquity of the city. In the Middle Ages Clermont was the residence of the counts of the same name, and the capital of the Province of Auvergne, and became the seat of one of the oldest bishoprics of

France. Several ecclesiastical councils were held here, the most remarkable of which was that in 1095, at which the First Crusade was decreed by Urban II. Among its monuments is a statue to Pascal, who was a native of Clermont.

CLERMONT L'HÉRAULT, lâ'rô', or CLERMONT DE LODÈVE. The capital of a canton in the Department of Hérault, France, situated on a castle-crowned hill, rising from the banks of the Ydroniel, 10 miles south of Lodève by rail. Its Romanesque Church of Saint Guelhelm-le-Dessert is a fine building of the thirteenth and fourteenth centuries. Clermont is noted for its woolen manufactures, especially army clothing, which date from 1678; it has also tanneries, potteries, manufactures of cutlery, lime and stone quarries, and a considerable trade in agricultural and commercial products. Population, in 1901, 5280.

CLERMONT TONNERRE, tô'nâr'. A well-known French family. It originated in Dauphin in the eleventh century. STANISLAS MARIE ADELAÏDE, Count de (1757-92), was born at Pont-à-Mousson. He entered the States-General in 1789 as representative of the nobility, and there, as well as in the National Assembly, acquired great influence. He was moderate in his views, argued for the English system of two legislative houses, and for the King's right to veto. With Malouet and others he founded, in 1790, in order to counteract the Jacobins, the Club des Amis de la Monarchie, and with Fontanes he published the *Journal des Impartiaux*. He perished in the massacre of August 10, 1792.—ALMÉ MARIE GASPARD, Marquis, and afterwards Duke de (1779-1865), born in Paris, was a French general and minister. He was educated at the Ecole Polytechnique, entered the army and served in the campaigns in Italy, Germany, and Spain. He was made aide-de-camp to Napoleon's brother Joseph, King of Spain. After the restoration of Louis XVIII, he became Minister of Marine, and later Minister of War. After the July Revolution he refused the oath of allegiance to the new government. He died in retirement January 8, 1865.

CLÉRY, klâ'tê', JEAN BAPTISTE ANTOINE HANET (1759-1809). The valet de chambre of Louis XVI. He was born near Versailles. By his own choice he followed the King to the Temple, and attended him with the greatest devotion. After his death he remained in imprisonment for some time, and then rejoined the royal family in Germany. In London he published his popular account of Louis's captivity, *Journal de ce qui s'est passé à la tour du Temple pendant la captivité de Louis XVI, roi de France* (1798), which has passed through many editions.

CLÉSINGER, klâ'zân'zhâ', JEAN BAPTISTE AUGUSTE (1814-83). A French sculptor. He was born at Besançon, October 22, 1814; studied with his father, and made his appearance in the Salon of 1843. His first work that attracted attention was "The Woman Bitten by a Serpent" (1847). He executed "Louise of Savoy" for the Garden of the Luxembourg. In 1877 he exhibited "The Dance with Castanets," a bronze statue, and in 1867, "Cleopatra Before Cæsar." He occasionally exhibited paintings of scenery and architecture. He married a daughter of George Sand. He died in Paris, January 7, 1883.

CLEVEDON, klēv'don. A watering-place in Somerset, England, on the Bristol Channel and Severn Estuary, nine miles northeast of Weston-super-Mare. It has a fine beach, marine promenade, a pier, and a coast-guard station. It is noted for literary associations with Coleridge; also with Hallam, the historian, and his son Arthur, commemorated by "In Memoriam," whose graves are in the parish church of Saint Andrew. Population, in 1891, 5412; in 1901, 5898.

CLEVELAND (ME. *clif*, *clef*, pl. *clives*, *cleres*, cliffs + *land*). A hilly region with some picturesque fertile valleys, forming the eastern part of the North Riding of Yorkshire, England, between Whitby and the Tees. Since 1851 it has become a populous mining district, owing to the discovery of ironstone. See MIDDLESBROUGH.

CLEVELAND. The county-seat of Cuyahoga County, Ohio, the largest city of the State, and the seventh in the United States, and an important industrial and commercial centre, situated on the south shore of Lake Erie, at the mouth of the Cuyahoga River, in latitude 41° 30' 5" N., longitude 81° 42' 6" W. (Map: Ohio, G 2). It is 138 miles northeast of Columbus, and 244 miles northeast of Cincinnati; 357 miles east of Chicago, 623 miles west by north of New York, and 527 miles northwest of Washington.

The city, 689 feet above sea-level, and, at its highest point, 302 feet above the lake, is beautifully situated on elevated land, which slopes gently toward the lake, and occupies an area of over 34 square miles, with a lake-frontage of 10 miles, and extending back more than half that distance. It is divided unevenly by the Cuyahoga River, the larger portion lying on the east side of that stream, and it is intersected also by Kingsbury and Walworth 'runs,' the east and west tributaries of the Cuyahoga. The land bordering the river is low and flat, and here lie many of the industrial works—lumber and coal yards, ore-docks, etc.—almost hidden from view. Owing to the variation in level of different parts of the city, there are several elevated viaducts and many bridges (a number of which are owned by the municipality) spanning the Cuyahoga, and uniting the sections of the city. The most remarkable of these is Superior Street Viaduct of stone and iron, completed in 1878, at a cost of \$2,250,000, 3211 feet long, with a central draw-bridge 68 feet above the water-level. The Central Viaduct, completed in 1888, crosses the river and is 2838 feet long. The Abbey Street Viaduct, crossing Walworth Run, is 1092 feet long. A smaller one (835 feet) spans Kingsbury Run.

Cleveland has features of beauty in its broad streets, ranging from 40 to 132 feet in width, which are so abundantly shaded with maples and elms that the city has acquired the name of the 'Forest City.' There are about 573 miles of streets, 252 miles of which are paved, brick and asphalt being extensively used. The public park system includes about 1440 acres, distributed in areas of varying extent throughout the city, and its suburban districts to the east and west are thoroughly accessible by the street railways, which operate about 220 miles of track. In contrast with its extensive industrial and commercial interests, Cleveland has very few large tenements, with congested population; even apartment houses are a recent development. Detached houses with gardens are the rule.

The lake-shore front, the valley of the Cuyahoga and the area along the Cleveland and Pittsburg Railroad from Wason Street southeast to the city limits are centres of the manufacturing industry, while the business area extends from the lower part of the river east along Superior Street, which is 132 feet wide, and along Euclid Avenue to Erie Street. The Public Square, or Monumental Park, containing the statue of Gen. Moses Cleaveland and the Soldiers' and Sailors' Monument, forms a park of 4½ acres about the intersection of Superior and Ontario Streets; from this centre and from Ontario Street, which extends north and south, the principal streets of the east side of the city diverge. The far-famed Euclid Avenue, 83 to 90 feet wide, begins at the southeast corner of the Public Square and extends beyond Lake View Cemetery, through the suburb of East Cleveland, the continuation beyond there being Euclid Road. From Monumental Park to some distance east of Erie Street this Avenue is one of the main business thoroughfares, but for the remainder of its length is built up with handsome private residences, surrounded by tasteful and well-shaded grounds. Other fine residence streets are Willson, Case, East Madison, Amesbury, Ingleside, Bolton, Lake, Jennings, and Franklin avenues, Prospect, East Prospect, and Detroit streets, and Overlook Road, the first two being 99 feet wide.

BUILDINGS. The more prominent buildings of the city include the City Hall, County Court-House, Chamber of Commerce, New Central Armory, Cleveland Grays' Armory, Public Library, Adelbert College, Medical College of Western Reserve University, Case School of Applied Science, Northern Ohio Insane Asylum, Union Depot, Young Men's Christian Association, and the New Sheriff Street Market, 400 feet long by 120 feet wide. The Arcade, 400 by 180 feet, built in 1889, at a cost of \$850,000, has a fine interior; arranged on both sides of a central court are the several tiers of stores and offices fronted by balconies. On Euclid Avenue, opposite Bond Street, and extending through to Prospect Street, is the Colonial Arcade Building, at the Prospect Street end of which is the Colonial Hotel. Other structures worthy of note are the Williamson, New England, Society for Savings, Citizens, American Trust, Schofield, Rose, Perry-Payne, Garfield, Cuyahoga, and Caxton buildings. The Plymouth and Pilgrim (Congregational), the First Methodist Episcopal and Epworth Memorial, First Presbyterian ("Old Stone Church"), Euclid Avenue Baptist, and Saint Paul's (Protestant Episcopal) churches, and the Roman Catholic cathedral, are among the finest ecclesiastical edifices.

Recently a plan has been projected systematically to beautify the city by grouping the public buildings that are to replace the present edifices, some of which are rented, and which on the whole are architecturally indifferent—an undertaking to which \$20,000,000 will ultimately be devoted. The public buildings will be arranged in a quadrangle inclosing a mall, the whole occupying a plot of land in the heart of the city one-eighth of a mile wide by one-half of a mile long. The scheme of the "group plan" consists in placing the new Post-Office, now under construction, and the proposed Public Library at the south end of the Mall; at the north end of the Mall and on its axis a monumental union railroad station will be placed, flanked

on either side by the County Court-House and the City Hall. An imposing Court of Honor will join these two groups of buildings.

PARKS AND CEMETERIES. Among the many fine parks belonging to the city, the largest is Rockefeller Park, of 260 acres, a part of which was given by the millionaire whose name it bears. It includes the Valley of Doan Brook, with several smaller parks and parkways, and is connected with Gordon and Wade Parks by the boulevard which extends also between these two. Gordon Park, on the lake-front, comprises 112 acres, and, with Wade Park (83 acres) to the southeast, is noted for its gardens. The latter contains the statue of Commodore Perry, formerly in Monumental Park, and a zoölogical garden. Edgewater Park (126 acres) has well-kept lawns, walks, and a beach with facilities for boating and bathing. Brookside Park (149 acres); Garfield Park (163 acres); Woodland Hills Park (102 acres); Shaker-Heights Park, just outside the city limits, and named from the community which once occupied the land; Lakeview Park, on the lake shore; Lincoln Park; and the Circle on the west side of the river, are also worthy of mention. Besides Euclid Avenue, the more attractive drives are the boulevard system of 33 miles, connecting the parks, and Lake Avenue and Clifton Boulevard.

Cleveland has a number of cemeteries, the largest of which are Woodland, Riverside, and Lakeview. The last, one of the most beautiful in the country, contains more than 300 acres, with great natural advantages skillfully improved. Here, on an eminence 250 feet above the level of the lake, stands the Garfield Memorial, completed in 1890 at a cost of \$225,000—the balcony near the top, 165 feet high, affording a fine view of the city and its suburbs. It is built principally of Ohio sandstone, and contains a chapel with symbolical panels and reliefs of scenes from the President's career, and his statue. His remains lie in a crypt beneath.

In Lakeview Cemetery is situated the Wade Memorial Chapel, which cost more than \$350,000.

EDUCATIONAL INSTITUTIONS AND LIBRARIES. Cleveland has the normal equipment of a great city in the matter of public schools, with a sufficient number of high and manual-training schools, besides numerous private and parochial institutions. The public-school system is conducted under what is coming to be known as the 'Cleveland Plan,' which prohibits all punishment, eliminates mechanical methods, introduces manual and domestic training to some extent in all grades, and practically abolishes stated written examinations—the teacher's judgment being accepted as the general basis of promotion. Cleveland was one of the first cities in the United States to establish a free high school, and the first west of the Alleghany Mountains, the date being July 13, 1846. The city is the seat of Western Reserve University (q.v.), with its departments of Adelbert College, Women's College, and schools of medicine, law, and dentistry; Case School of Applied Science (q.v.); and Saint Ignatius College (Roman Catholic). It contains also Saint Mary's Theological Seminary (Roman Catholic), Baldwin University Law School, Cleveland College of Law, Cleveland College of Physicians and Surgeons (Ohio Wesleyan University), Cleveland Homeopathic Medical College, and Cleveland School of Pharmacy.

In addition to libraries of the various educational institutions, Cleveland has a Public Library of over 236,000 volumes, the Case Library (subscription) of 50,000 volumes, Cleveland Medical Library Association, Law Library Association, and the Western Reserve Historical Society.

CHARITIES. The State institution for the insane, founded in 1855, has 98 acres of ground and buildings that accommodate 1250 patients. The City Infirmary and Hospital treat annually 3400 patients, and maintain a department for out-door relief. Among several other hospitals may be noted the Lakeside Hospital, Federal Marine, Cleveland General, Cleveland Homeopathic, Saint Alexis, Saint Claire, Saint John's, and Saint Vincent's Charity hospitals. Other institutions are a house of correction, industrial schools, homes for the aged, and Jewish, Roman Catholic, and Protestant orphanages. Prominent in the charitable work of Cleveland is the Goodrich House, incorporated in 1897—a social settlement in the poorer part of the city, which contains clubs, kindergartens, a gymnasium, bath, sewing-rooms, a public laundry, and parlors and reading-rooms. With this equipment the Goodrich House, constructed at a cost of \$80,000 and expressly for its work, stands among the foremost institutional houses in the United States. It is estimated that the charitable institutions, the more prominent being the Alta House and the Hiram House, control property exceeding in value \$3,500,000.

CLUBS, THEATRES, AND HOTELS. The Union, Roadside, Tavern, Colonial, Rowfant, Excelsior, and the Euclid and Country clubs, all owning the houses in which they are installed, the last-named being six miles distant to the east on the lake-front, are representative organizations. Among the principal places of amusement are the Euclid Avenue Opera House and Keith's, Lyceum, Empire, and Colonial theatres. The more prominent hotels include the Hollenden, Colonial, Hotel Euclid, Forest City, Baldwin, Tavistock, American, Kennard, and Hawley House.

COMMERCE AND INDUSTRY. The construction of the Ohio Canal—completed in 1832—connecting Lake Erie with the Ohio River, the northern terminus being the Cuyahoga River, gave Cleveland commercial advantages over other cities on Lake Erie; and, though the canal has since declined greatly in importance, the city has now other and greater advantages by virtue of its location. Chief of these is its proximity to the coal and oil fields of Ohio and Pennsylvania and to the iron-producing regions of Lake Superior, Cleveland being one of the most convenient points for the collection and distribution of the products of both districts. The city has thus become an important commercial centre, and also a manufacturing place of the first rank.

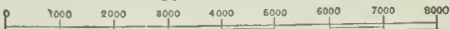
The bulk of the lake traffic consists of coal and iron. The receipts of coal in 1902 amounted to 5,860,000 tons, or three times that of 1890; and the shipments for the same year were 2,505,000 tons, or twice that of 1890. The coal is distributed among the various lake ports farther west and north. The receipts of iron ore in 1902 were 4,993,000 tons, as against 3,823,000 in 1900 or 1,950,000 tons in 1890. Lumber and grain are next in importance. Cleveland is the largest market for fresh-water fish in America.

The city has remarkable advantages for the accommodation of its shipping—two parallel

CLEVELAND, OHIO.

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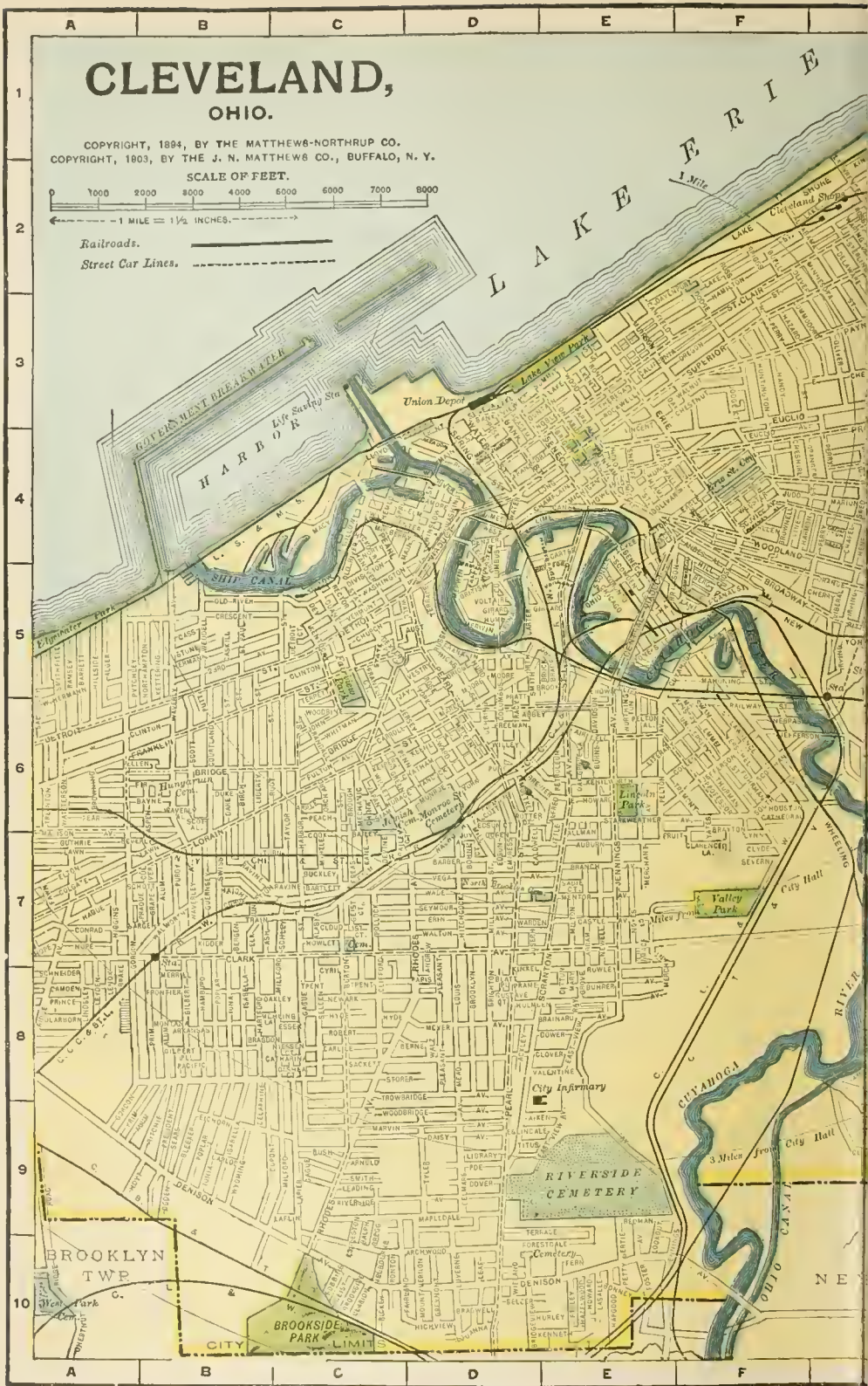
SCALE OF FEET.



← 1 MILE = 1 1/2 INCHES. →

Railroads. —————

Street Car Lines. - - - - -





piers, built out 1500 feet into the lake, form a channel 200 feet wide and 21 feet deep at the mouth of the Cuyahoga; and the many windings of the latter afford 16 miles of river-frontage, over five of which are docked. A branch of the Cuyahoga flowing westward, not far from the lake, and parallel with it, has been dredged so as to afford room for excellent ship-yards and docks. In 1878 the United States Government began a breakwater to inclose a harbor of refuge 360 acres in extent, with an opening of 500 feet, opposite the mouth of the river. Later plans and appropriations, however, provide for an opening of 700 feet and a breakwater 4 miles in length, inclosing a harbor of 800 acres; over 2 miles of breakwater have been completed at a cost of \$3,200,000, and the remaining 2 miles, now under contract, will cost about \$2,000,000. The harbor is being dredged to 25 feet. In the number of tons of freight received and shipped by vessel, Cleveland ranks fourth among the ports of the Great Lakes. Cleveland is on nine railways, some of which are the leading trunk-lines of the country: the Lake Shore and Michigan Southern; the New York, Chicago and Saint Louis; and the Pennsylvania.

Cleveland is now the second largest manufacturing centre on the Great Lakes and is rapidly gaining on Cincinnati, its only rival within the State. During the decade 1890-1900, the value of its product increased from \$113,240,000 to \$139,849,000, or 23.5 per cent. In the latter year there were employed 58,800 wage-earners. As above intimated, the most important group of manufactures consists of iron and steel, and the large number of industries which depend upon iron and steel as their raw material. According to the census of 1900, the iron and steel products were valued at \$24,276,000, and the foundry and machine-shop products ranked second with a product estimated at \$15,428,000. Other important industries are the production of wire and wire nails, in which Cleveland outranks all other American cities, and hardware, in which it takes second place; bridges, electrical apparatus and supplies, car-wheels, printing-presses, sewing-machines, bolts, nuts, washers, and rivets. Another industry of this group is shipbuilding. From an early date Cleveland led in the construction of wooden vessels for the lake traffic, and, with the change from wood to iron, has continued in the lead, producing to-day more steel merchant vessels than any other American city. The chief industries which depend upon agricultural resources are slaughtering and meat-packing, and the manufacture of malt liquors, the former exceeding a value of \$7,500,000 and the latter \$4,000,000, according to the census of 1900. The Standard Oil Company has here one of its principal refining establishments. Cabinet works and clothing-factories are important. Cleveland makes more paint than any other city in the world.

GOVERNMENT, FINANCE, ETC. A new charter was obtained in 1891, in which the distinction between executive and legislative functions was clearly drawn, the new plan being known as the Federal System. But a new municipal code was enacted by the Ohio Legislature October 22, 1902. It provides for a City Council of 32 members. The Mayor, the Vice-Mayor (who is president of the Council and has the deciding vote), the three members of the Board of Public Service,

the solicitor, and the treasurer are elected biennially by the people. The Board of Public Safety of two members is appointed by the Mayor, subject to the approval of two-thirds of the Council. The School Council of 7 members (who elect the director of schools and the superintendent), and the city auditor, police judge, and the clerk of police court are elected by the people. Firemen and policemen are under civil service regulations.

In 1900 the total indebtedness amounted to \$15,258,295, for which a sinking-fund provided \$2,575,935. The net per capita debt was \$37.52. The total tax-rate is \$30 per \$1000, of which \$10.20 is for school purposes, \$13 for city purposes, \$3.90 for county, and \$2.90 for State purposes. The total actual income for 1900 was \$5,077,400, of which the property tax was \$3,564,000. The total expenditures for maintenance and operation were \$5,976,000, and for construction and other capital outlay, \$4,332,000.

The ample water-supply formerly was pumped into reservoirs from two tunnels sunk 90 feet deep, and running out for one and one-half miles to a crib on the lake bottom. A new crib and tunnel have recently been constructed, the crib four miles from shore. These works were originally constructed and are still owned and operated by the city.

POPULATION. Cleveland rose during the decade 1890-1900 from tenth to seventh rank among the cities of the United States, and is now the third largest city west of the Alleghanies, and the second largest of the Great Lakes cities. The following gives her population by decades: in 1830, 1076; in 1840, 6071; in 1850, 17,034; in 1860, 43,419; in 1870, 92,829; in 1880, 160,146; in 1890, 261,353; in 1900, 381,768. There are few negroes, but many foreigners, the foreign-born in 1900 numbering 124,600, or nearly one-third of the total. Among the foreign-born the Germans are predominant, constituting in 1890 about 41 per cent., as against 13 per cent. for the Irish, and 11 per cent. each for the Bohemians and English. The native whites of foreign parents numbered 163,500. Thus, the native whites of native parents and the negroes together constitute less than one-fourth of the total.

HISTORY. In 1795 the Connecticut Land Company bought from Connecticut a large part of that State's Western Reserve (q.v.), and in the following year sent out a party under Gen. Moses Cleaveland to survey their purchase. Cleaveland selected the mouth of the Cuyahoga as the site for a settlement, and in July, 1796, laid out on the east bank a village, which took his name, though the spelling was changed in 1831 to meet the exigencies of a newspaper editor's head-lines. In 1800, by act of Congress, the Western Reserve was included for administrative purposes in the Northwest Territory, and Trumbull County was erected to include the land about the mouth of the Cuyahoga. Of this, Cleveland, then having a population of about 57, became the county-seat in 1809. In 1814, Trumbull County having previously been subdivided, the village of Cleaveland, in the county of Cuyahoga, was incorporated with a population of less than 100. In 1818 the first newspaper, *The Cleveland Gazette and Commercial Register*, began publication, and in 1827 the Ohio Canal, which five years later was completed to the Ohio, was opened between Cleveland and Akron, giving such an impetus to the former that her population increased tenfold

(from 600 to 6000) between 1825 and 1835. In 1836 Cleveland was chartered as a city. In the early fifties it was first connected by rail with the East and with the other cities in Ohio, and from this period dates its marvelously rapid growth. In 1853 Ohio City, which had been founded in 1817, and for many years had been a great rival, was united to Cleveland. During the Civil War a number of manufacturing establishments were set up here, and in the interval 1861-65, owing to its ability to supply articles for which there was then an extraordinary demand, Cleveland attracted many investors; its lake traffic was doubled, and its population increased 50 per cent. In 1872 it annexed East Cleveland, in 1873 Newburg, and in 1893 West Cleveland and Brooklyn.

Consult: Robison, *History of the City of Cleveland* (Cleveland, 1887); Avery, *Cleveland in a Nutshell* (Cleveland, 1893); Howe, *Historical Collections of Ohio* (Columbus, 1889-91); Kennedy, *History of Cleveland* (Cleveland, 1896).

CLEVELAND. A city and the county-seat of Bradley County, Tenn., 30 miles east by north of Chattanooga; on the Southern Railroad (Map: Tennessee, G 5). It is the seat of the Centenary Female College. The city is in a fertile agricultural district, has considerable trade, and contains woolen-mills, flour-mills, stove-works, a chair-factory, etc. Settled about 1820, Cleveland was incorporated about 1880. The government is administered under a revised charter of 1898, which provides for a mayor, biennially elected, and a municipal council. Population, in 1890, 2863; in 1900, 3858.

CLEVELAND, CHARLES DEXTER (1802-69). An American educator, born in Massachusetts. He graduated at Dartmouth in 1827, and was professor of Latin and Greek in Dickinson College, and of Latin in the University of the City of New York. From 1861 to 1867 he was United States consul at Cardiff, Wales. He was a voluminous writer, but will be remembered only for his compendiums of *English Literature* (1850), *American Literature* (1858), and *Classical Literature* (1861); *English Literature in the Nineteenth Century* (1851); an edition of *Milton's Poetical Works*, with a *Life* (1851).

CLEVELAND, JOHN (1613-58). An English Cavalier poet. He was born at Loughborough, Leicester, and educated at Cambridge, where, in 1634, he became a fellow of Saint John's. Six years later he strenuously opposed Cromwell, and in consequence lost his fellowship in 1645. Joining the Royalists, he was appointed judge-advocate in the King's army. In 1655 he was seized at Norwich and imprisoned at Yarmouth for three months, when he was released by Cromwell. After that he lived in retirement. Cleveland had a great reputation as a wit and satirist. A volume of his poems in circulation before 1656 was reissued in that year. In 1677 appeared his collection entitled *Clevelandi Indiciæ: or Cleveland's Genuine Poems*, etc. It is incomplete. Cleveland still awaits a competent editor. Thomas Fuller describes him as "a general artist, pure Latinist, exquisite orator, and eminent poet."

CLEVELAND, (STEPHEN) GROVER (1837—). The twenty-second and twenty-fourth President of the United States. He was born at Caldwell, Essex County, N. J., March 18, 1837. In 1841

his father, the Rev. Richard F. Cleveland (Yale, 1824), a Presbyterian minister, removed with his family to Fayetteville, near Syracuse, N. Y., and afterwards to Clinton, N. Y., in the schools of which places Grover Cleveland was a scholar. The death of his father in 1853 obliged him to earn his own living, and the first position that he held was that of a teacher in the New York Institution for the Blind. A little later he started for Cleveland, Ohio, where he expected to study and practice law. While passing through Buffalo, however, he was induced to remain there by his uncle, Lewis F. Allen, who secured for him a position with a prominent law firm. He was admitted to practice in 1859; became assistant district attorney for Erie County in 1863; was the Democratic candidate for district attorney in 1863, but was defeated at the polls; and in 1870 was elected sheriff of the county. At the conclusion of his term of office of three years, he resumed the practice of law, with marked success. In November, 1881, he was nominated as Democratic candidate for Mayor of Buffalo. The city was strongly Republican, but long-continued tenure of office had engendered flagrant corruption, and good men of all parties joined to uproot it. Cleveland, being elected by a handsome majority, reorganized the departments under his charge on business principles, overcame corrupt combinations, and promptly vetoed all measures that savored of extravagance or dishonesty. His notable service in that office was recognized in 1882, when he received the Democratic nomination for Governor of New York. His opponent was Charles J. Folger (q.v.), then Secretary of the Treasury under President Arthur. The Republican Party in the State was divided, and among the independent voters there was strong dissatisfaction with the methods that had secured Mr. Folger's nomination. Mr. Cleveland's reputation as a reformer was strongly in his favor, and he was elected by the extraordinary plurality of 192,854. His conduct as Governor was marked by integrity, independence, and good judgment, and he was early spoken of as a candidate for the Presidency. At the Democratic National Convention, July, 1884, he was the leading candidate on the first ballot, and in spite of a zealous minority of delegates from his own State, secured the necessary two-thirds of all the votes on the second ballot. A large body of Independent Republicans declared themselves in his favor; but the accession of this new element was partly offset by the defection of many Democrats. Cleveland received 219 electoral votes against 182 for his opponent, James G. Blaine. Besides the Southern States, he carried Connecticut, New York, New Jersey, and Indiana. He was inaugurated March 4, 1885. On June 2 of the following year he married Miss Frances Folsom. His term was characterized mainly by his bold advocacy of a reduction of tariff duties, and by his opposition to what he considered unworthy bills. During his term he vetoed or 'pocketed' 413 bills, 297 of which were private pension bills. During the first session of Congress he directly antagonized the Senate by refusing to give to that body his reasons for removing certain officers, or to deliver up the papers ordering such removals; on the ground that, under the Constitution, the President is not amenable to Congress for such acts, and that the papers were not official documents. His supporters maintain that, considering

the immense difficulties surrounding such an undertaking, his civil-service reform pledges were carried out as consistently as possible. He was renominated for the Presidency at Saint Louis, June 7, 1888, but was defeated, receiving only 168 electoral votes to Harrison's 233, though his popular vote exceeded by more than 100,000 that of his opponent. On the expiration of his term of office he resumed in New York City the practice of law, but still kept in touch with the political interests of his party. At the National Democratic Convention of June, 1892, although opposed by the delegation from his own State, he was nominated for the Presidency on the first ballot, and in November was elected, receiving 277 electoral votes against 145 for Harrison (Republican) and 22 for Weaver (Populist). During his second term, in the face of the violent opposition of the mass of his own party, he exerted himself unflinchingly for the maintenance of the gold standard. To this end he called an extra session of Congress in the summer of 1893, and secured the repeal of the Sherman Act of 1890, requiring the Government to make large purchases of silver bullion. He maintained the gold reserve by successive issues of Government bonds. When the Democratic majority of Congress passed a tariff act, he allowed it to become a law without his signature, considering it inadequate in many of its provisions. During the great railroad strike at Chicago in 1894 he ordered out the United States troops to "prevent the obstruction of the mails," although Governor Altgeld, of Illinois, who had not asked for the troops, protested vigorously against the measure. In the domain of foreign affairs, Mr. Cleveland's second administration was signalized by his withdrawal from the Senate of the Hawaiian Annexation Treaty negotiated by President Harrison; the upholding and advancement of the Monroe Doctrine by his vigorous and successful insistence upon the submission to arbitration of the long-standing boundary dispute between Great Britain and Venezuela; and the promulgation of the Bering Sea arbitration award. In consequence mainly of Mr. Cleveland's position on the currency question, his administration was not endorsed by the Democratic National Convention of 1896. In the ensuing Presidential campaign he supported General Palmer, the candidate of the Sound-Money Democrats. Since his retirement he has lived at Princeton, N. J. He has of late delivered, at Princeton University, two lectures annually on questions of public policy, which have been printed. Consult: Whittle, *Grover Cleveland* (London and New York, 1896); and an appreciation in Peck, *The Personal Equation* (New York, 1897).

CLEVENGER, SIOBAL VAIL (1812-43). An American sculptor, born at Middletown, Ohio. He first became known through his work as a stone-carver in Cincinnati, and afterwards opened a studio in New York. He executed busts of Clay, Webster, Van Buren, Allston, Everett, and others. His portrait bust of Webster has been used on a United States postage-stamp, and is considered the best likeness of that statesman. He realized his own deficiencies in artistic education, and took advantage of an opportunity to go to Rome in 1840. While there he produced his "North American Indian," which is characterized by the sincere, bold treatment and skill in handling his material shown in all Clevenger's work. But for

his early death, which occurred while he was on his way home, he would probably have attained high rank in his profession.

CLEVES, klévz (Dutch *Kleefs*, Ger. *Kleve*, Fr. *Clèves*). A German town of Dutch origin, and former capital of a duchy of the same name, situated in the Rhine Province of Prussia, about five miles from the frontier of the Netherlands (Map: Prussia, B 3). It is built on three hills, and has still retained some of its Dutch characteristics. It contains an old palace, the former abode of the Dukes of Cleves, now used as a law-court and prison; an old Rathaus, with a number of antiquities and paintings; and an old Catholic church, built in Gothic style, and containing the tombs of the counts of Cleves. In the vicinity of the town are situated chalybeate springs. Cleves is frequented as a summer resort by the Dutch. Population, in 1890, 10,409; in 1900, 14,684. The Duchy of Cleves, which arose in the Middle Ages, and which at the time of the Reformation was united with the duchies of Jülich and Berg, passed in the seventeenth century into the possession of Brandenburg. It was wrested from Prussia in the course of the Napoleonic wars, but restored in 1815.

CLEW. See SAILS.

CLEWS, HENRY (1830—). An American banker, born in Staffordshire, England. He entered mercantile pursuits in New York City in 1845, became a member of various firms, and in 1877 organized the firm of Henry Clews and Company. He was a founder of the Union League Club, New York City, and also long treasurer of the American Geographical Society and of the Society for the Prevention of Cruelty to Animals. He has published *Twenty-eight Years in Wall Street* (1888), and *The Wall Street Point of View* (1900).

CLICHÉ, klé'shá' (Fr., stereotyped). An electrotype plate, the impression of a die in a mass of fusible metal. It is employed by medalists and die-sinkers to make proofs of their work, and in order to judge the stage of their work before the die is hardened. The term is also applied to any stereotype plate used in modern reproductive processes, such as photographic proofs on glass, either positives or negatives.

CLICHY, or **CLICHY-LA-GARENNE**, klé'shé'lá-gá'rén'. A northwestern suburb of Paris, France. Population, in 1901, 39,291.

CLICK-BEETLE. A beetle of the family Elateridae, also known as elater, snapping-bug, and skip-jack, on account of its acrobatic performances. When disturbed these beetles curl up their legs and fall to the ground, where they lie rigid on their backs for some moments, and then begin a series of springs into the air, accompanied by a clicking sound. When the beetle succeeds in landing on its feet, it runs off. In regard to the springing, Le Conte says: "This is effected by extending the prothorax so as to bring the prosternal spine to the anterior part of the mesosternal cavity; then, suddenly relaxing the muscles, so that the spine descends violently into the cavity, the force given by this sudden movement causes the base of the elytra to strike the supporting surface, and by their elasticity the whole body is propelled upward." The larvae, known as wireworms, are hard, brownish-yellow,

and may live several years before gaining maturity. Most of them are found under bark and in rotten wood, but some live on the ground on the roots of grass, Indian corn, and other grains, as well as on those of certain vegetables. When numerous enough they may do considerable damage. Fall plowing is said to be the most effective remedy against them. Of the 7000 described species of elaters 500 occur in North America. The most conspicuous click-beetle found in the United States is the eyed elater (*Alaus oculatus*), a grayish black beetle with two large black eye-like spots on the prothorax; its larvæ live in rotting stumps. In the tropics of America there are luminous species belonging to the genus *Pyrophorus*, as the cucuyo (*Pyrophorus noctilucus*) and others.

BIBLIOGRAPHY. De Candeze, *Monographic des Elaterides* (4 volumes and 3 supplements, Liège, 1857-1881); Le Conte, "Revision of the Elateridæ of the United States," in *Transactions of Philosophical Society*, vol. x. (Philadelphia, 1853); Horn, *Papers in Transactions American Entomological Society*, vols. xii., xiii., xviii. (Philadelphia, 1885, '86, '91). See FIREFLY.

CLIDOMAN'CY. See SUPERSTITION.

CLIENT (Lat. *cliens*, *eluens*, hearer, from *cluere*, Gk. κλύω, *klyein*, Skt. *śru*, to hear; connected ultimately with AS. *hlūd*, Engl. *loud*). In law, one who consults or retains an attorney or counselor-at-law for advice, or to prosecute, manage, or defend an action at law, or to represent him in any proceedings or business matters. The client's relations with the attorney are in the highest degree confidential, and the client is protected by the most stringent rules of law in making disclosures of his private affairs to his legal adviser. See ATTORNEY; PRIVILEGED COMMUNICATION.

CLIFF (AS. *clif*, Icel., OS., Dutch *klif*, from Icel. *klifa*, ME. *cliven*, to climb). A precipitous slope of the land surface. Cliffs may be formed in three ways: (1) by the erosive action of water; (2) by the disintegrating influence of rain, frosts, and the atmosphere, or weathering; (3) by dislocations of the earth's crust. On rocky coasts cliffs are carved out by the force of waves, which beat against the shore-line, and by weathering of the rock that lies above the reach of the waves. The cliffs of Dover and of the Orkney and Shetland islands are notable examples of sea-cliffs. Gorges, cañons, and ravines, which are characterized by steep walls, are excavated by the erosion of running water; they are usually found along the upper courses of rivers. Cliffs may mark the line of outcrop of stratified rocks, and in such cases are usually to be traced to differential weathering of hard and soft strata. In regions of disturbance, cliffs are formed by faulting, which exposes a vertical rock-face or scarp. Many of the notable elevations in the Adirondacks are characterized by faulted scarps. See SHORE; CAÑON; FAULT; etc.

CLIFF-DWELLER. A name frequently used to designate the supposed extinct builders of the numerous ancient cliff ruins scattered throughout the cañons and mesas of the arid Southwest, along the upper waters of the Colorado and Rio Grande—in Utah, Colorado, Arizona, and New Mexico. The ruins are either upon the summits of the mesas or on shelves in the rock-walls of the cañons. For a long time their origin was

a subject of much speculation; but recent ethnologic investigation has proved that these ruins are not the work of any extinct or distinct race, but were built by the immediate ancestors of the modern Pueblo Indians (q.v.), some of whom, in fact, notably the Hopi, still have their villages upon the summits of almost inaccessible mesas for better protection against the wilder Navajo and Apache, by whom they are surrounded. Cliff-dwellings are divided into two types: (1) Habitations built in niches or clefts in the cañon-walls; and (2) domiciles excavated in softer beds between hard ledges in the cliffs, sometimes called 'caveate lodges.' See ARCHEOLOGY, AMERICAN. For illustration, see CASA GRANDE.

CLIFFORD, GEORGE, Earl of Cumberland (1558-1605). An English naval commander and buccaneer, born in Westmoreland. He took the degree of M.A. at Cambridge in 1576, and in 1588 commanded the *Elizabeth Bonaventure*, in the actions against the Spanish Armada. Thenceforward he was active chiefly in fitting out and conducting piratical expeditions. Of these the most important were one undertaken with seven sail, in 1589, which captured several rich prizes, and one with twenty sail, in 1598, which took San Juan de Puerto Rico, but failed in an attempt to intercept the Spanish treasure-galleons.

CLIFFORD, LUCY LANE (Mrs. William Kingdon). An English novelist. She was the daughter of John Lane of Barbados, in the British West Indies, and in 1875 married William Kingdon Clifford, the distinguished mathematician, who died four years later. Mrs. Clifford is best known by *Love Letters of a Worldly Woman* (1891) and *Aunt Anne* (1892). Among her other popular books are: *Any How Stories* (1882; reissued with additions, 1899); *Mrs. Keith's Crime* (1885); *The Last Touches* (1893); *A Wild Proxy* (1894); *A Flash of Summer* (1895); *Merc Stories* (1896); *The Dominant Note and Other Stories* (1897); and *Margaret Vincent* (1902).

CLIFFORD, PAUL. The hero of Bulwer's novel of the same name, a highwayman who is finally reformed through love.

CLIFFORD, NATHAN (1803-81). An American jurist, born in Rumney, N. H. He graduated at the Hampton Literary Institution, was admitted to the bar, and commenced practice in York County, Maine, in 1827. He was a member of the State Legislature from 1830 to 1834, was Speaker of the House for the last two years, and was Attorney-General from 1834 until 1838. He served in Congress from 1839 to 1843, and in 1846 was Attorney-General in President Polk's Cabinet. At the close of the Mexican War he went as a special United States envoy to Mexico, and negotiated a treaty by which California and other territories became a part of the United States. In 1858 he became, by President Buchanan's appointment, an associate justice of the United States Supreme Court, and in 1877 was president of the Electoral Commission (q.v.) that decided the Hayes-Tilden Presidential controversy. He published *United States Circuit Court Reports* (1869).

CLIFFORD, WILLIAM KINGDON (1845-1879). An English mathematician and physicist, born at Exeter. He was educated at a school in his native town, at King's College, London, and at Trinity College, Cambridge, where he was second

wrangler in the mathematical tripos of 1867. In August, 1871, he was elected to the chair of mathematics and mechanics at University College, London, which post he retained until his untimely death at Madeira, March 3, 1879. Clifford first established his reputation as an original thinker with the faculty of expressing scientific thought in plain and simple language by a lecture at the Royal Institution, *On Some of the Conditions of Mental Development*. He was a valued member of the London Mathematical Society, contributing to the *Proceedings*; for a time he acted as secretary, and afterwards vice-president of the mathematical and physical section of the British Association; he also lectured to the Sunday Lecture Society on such subjects as *Ether*; *Atoms*; and *The Sun's Place in the Universe*, and took an active interest in popularizing science. The versatility of his mind in philosophical and scientific discussion was further shown by his varied contributions to periodical literature. Besides these articles, and many papers on mathematics, he issued the first part of a larger text-book, *Elements of Dynamics* (1878). See Clifford's *Lectures and Essays*, edited by Leslie Stephen and F. Pollock (London, 1879), which contains a biographical sketch by the latter editor.

CLIFFORD'S INN. An inn of Chancery, attached to the Inner Temple, in London, built in 1345, and named after Robert de Clifford, who lived in Edward II.'s reign. Like the other Inns of Chancery it is now used for office and business purposes.

CLIFF-PLANTS. A group of drought-plants, xerophytes (q.v.), found chiefly on river, lake, or sea cliffs. See ROCK-PLANTS.

CLIFF-SWALLOW, or EAVES-SWALLOW. A swallow (*Petrochelidon lunifrons*) familiar throughout North America as one of those that make their nests about barns and outhouses. (See BARN-SWALLOW.) It is distinguished from other semi-domestic swallows by its short, square tail, reddish rump, grayish breast and collar, and white forehead; and by the fact that it places its flask-shaped nests of mud always on the *outside* of the building, unlike the fork-tailed true barn-swallows, which go inside the building to nest. This swallow originally nested in colonies wherever a rocky cliff afforded a chance to fasten their nests in close companies upon its face. (See Plate of FAMILIAR SWALLOWS.) These nests were globular, with a spout-like neck, forming the entrance, and were formed of pellets of mud, and lined with grass and feathers. As soon as human settlements began near their resorts, these swallows abandoned the cliffs for the more secure, better-sheltered place under the eaves of such buildings as they were permitted to occupy; and as the spread of civilization has finally covered most of the range of the species, only a few places in the remote West remain where these birds may be seen nesting after their primitive habit. In the eastern part of the country interesting modifications of habit have followed their long-continued association with man—among others, a disposition to make a much simpler style of nest, leaving off the domed roof and flask-like entrance, and forming little more than a cup in its place, since the overhanging eaves keep off the rain and conceal the sitting bird. This genus is almost cosmopolitan, has similar habits nearly everywhere, and in all countries attaches itself

to and is welcomed by civilization. Consult Ingersoll, *Wild Life of Orchard and Field* (New York, 1902).

CLIFTON. A beautiful and favorite watering-place in the southwest of Gloucestershire, England, forming the western suburb and part of the Parliamentary borough of Bristol (Map: England, D 5). It has a tepid spring of 73° F., which contains carbonic acid and salts of magnesia, and was brought into notice about 1695. The deep valley of the Avon is here spanned by a graceful suspension bridge. Population, in 1891, 44,700; in 1901, 44,400. See BRISTOL.

CLIFTON, or SUSPENSION BRIDGE. Former name of the town of Niagara Falls (q.v.), Ontario, Canada.

CLIFTON SPRINGS. A village in Ontario County, N. Y., 39 miles southeast of Rochester; on the Lehigh Valley and the New York Central and Hudson River railroads (Map: New York, C 3). It is situated amid beautiful scenery, and is famous for its sulphur springs and the well-equipped Clifton Springs Sanitarium. The village has two public parks and libraries. Settled about 1850, Clifton Springs was incorporated as a village in 1859. It owns and operates its water-works. Population, in 1890, 1297; in 1900, 1617.

CLIM, klím, or CLYM OF THE CLOUGH, Kluf (Clim of the valley, Teel. *klofi*, ravine, from *klüfa*, to split, AS. *clēofan*, to cleave). An English archer, said to have lived one generation previous to Robin Hood. He is known through the old ballad *Adam Bell, Clym of the Cloughe, and Wyllfum of Cloudestlee*. The story runs that these three men were outlawed for stealing venison, and passed through many adventures and hard fights with the sheriffs, justices, and mayor of 'Merrie Carlile.' They went to the King for pardon; but he would have hanged them if the Queen had not interceded for them. The ballad is far older than the oldest copy extant, which is the standard version, printed by Copeland about 1550. A fragment of an older one exists, recovered by Payne Collier. It is curious to notice that in this ballad William of Cloudestlee shoots an apple from his son's head at six score paces, in the presence of the King and Queen, after the manner of William Tell, of the Continental legend.

CLIMACTERIC YEAR (Lat. *climactericus*, Gk. *κλιμακτηρικὸς*, *klimaktērikos*, climacteric, from *κλιμάκτηρ*, *klimaktēr*, round of a ladder dangerous point in life, from *κλίμαξ*, *klímaz*, ladder, staircase). The year in the life of a woman during which she undergoes what is commonly called the 'change of life,' and which generally falls between her forty-fifth and fiftieth years. The term 'climacteric years' was once applied also to certain years in man's life, which were long believed by the disciples of astrology to have a peculiar significance, and to be the critical points of his health and fortune. Crises of this kind were, namely, supposed to be reached in the twenty-first, the thirty-fifth, the forty-ninth, and the sixty-third years of man's life. The most important of all was the sixty-third year, which was called—by way of eminence—the climacteric year, or the 'grand climacteric.' This year was supposed to be fatal to most men, owing to the fact that sixty-three is the product of the two mystical numbers seven and nine.

CLIMATE (OF. *climat*, from Lat. *clima*, Gk. *κλίμα*, *klima*, region, slope, from *κλίνω*, *klinein*, to incline). A word used in meteorology to indicate the summation or general result of all the solar and terrestrial influences that affect animal or vegetable life. It is possible, in fact, to disregard the relation to life, and consider only the meteorological phenomena as such, or the phenomena that affect any phase of our activity. Thus, one may ask, How does the climate favor navigation by sailing vessels, or the use of the wind as a motive power? In one region the climate may favor the development of a certain disease; in another, it may favor the development of special varieties of plants or animals. The specific features that favor the growth of either plants or animals, enabling them to make a specific spot their home, are oftentimes so obscure as to elude our observation and record; therefore, climatology is, in many respects, still an unsatisfactory study; but it has made such progress in the past fifty years as to have become exceedingly important to many classes of industries, as well as to physicians, naturalists, and agriculturists. Some varieties of plants are so dependent upon the nature of the soil in which they grow that Dr. Milton Whitney, of the United States Department of Agriculture, has advocated defining climatology as that which concerns the soil around the roots of the plant; but this is too narrow a view of the subject.

According to the usage of classic Greek, climate concerned principally the temperature of a place as regulated by the altitude of the sun at midday. As this varies with latitude, the ancients divided the known globe into zones two degrees broad in latitude, each of which was supposed to have its climate. At the present time, by combining the accumulated work of thousands of observers, we divide the globe into irregular regions, each of which differs from its neighbor in some important climatic condition as to temperature, rainfall, pressure, moisture, or the inclination of the sun and the amount of cloudiness. In the extensive works of the most eminent writers on climatology, especially those of Dr. Julius Hann, of Vienna, a large number of meteorological items are enumerated as being essential to a complete study of the climate of any place. These items include not merely the mean temperature, rainfall, cloudiness, the barometric pressure and relative humidity, but also the variations of these quantities, viz. their highest and lowest values each day, or month, or year, and the liability to sudden rises or falls. For navigation and the use of windmills, we need to know the average velocity of the wind, and perhaps especially the number of hours during which the wind exceeds a specified limit. With reference to the growth or importation of tender plants, the agriculturist needs to know the mean dates of the last frost of spring and the first frost of the autumn, the difference between which is ordinarily called the growing season. Since the establishment of the fact that the germination of seed, the growth of the plant, and the ripening of the harvest requires a certain amount of heat or molecular energy, efforts have been made to determine the thermal constants for many plants, and for each phase in growth. This 'thermal constant' is usually expressed as the sum total of the average daily temperatures when such temperatures are

above 42° F. There is also a 'rainfall constant' peculiar to each species of plant, the nature of which has been investigated by Linsser, who has shown that plants are able, by gradual evolution, to change their own thermal and aqueous constants, and eventually adapt themselves to a change in climate. Linsser's laws serve as a guide to those who would transplant a species from one part of the world to another of different climate.

In the study of climate with reference to navigation, we have to consider the frequency of destructive storm-winds. Charts showing this factor have been published for all the oceans and seas by the hydrographic offices of England, France, Holland, Russia, and the United States. In addition to this, for the special benefit of sailing vessels, Galton has shown how to prepare charts showing, for each square degree, the progress that a vessel of a certain size and rig would make if her sails were set so that she should go in a certain direction. From the point of view of insurance, both life insurance and fire insurance, the destruction by wind, hail, and lightning has been studied; these data, being plotted on charts, show the climate of the country from that point of view. Perhaps the most general idea of the distribution of climate is given by charts which show the frequency per month or year with which storm-centres pass over a given locality, and the direction in which they pass. A map of such frequency for the eastern portion of the United States was first published in the Statistical Atlas of Gen. Francis A. Walker in 1874, and the most extensive publication of this kind was published in 1893 as *Weather Bureau Bulletin 4*, showing the frequency of storm-paths for all parts of the Northern Hemisphere. The wind, rain, and temperature are so distributed around a storm-centre that, when its location is known, the distribution of all the others can be closely estimated. In general, in the Northern Hemisphere, the regions that lie to the south of the paths of the storm-centres have prevailing warm, moist, southerly winds followed by occasional sudden changes to cool, dry, westerly winds. This change occurs with every passing storm-centre, but the prevailing weather is clear and pleasant. Stations lying on the north of the paths of the storm-centres have prevailing easterly winds, with cloud and rain followed by cool northwest winds; but the time occupied by the trying easterly winds is proportionately larger.

It is diligent to describe or exhibit the climatic peculiarities of any region without the use of charts. Elaborate publications of this kind, for United States weather, have issued from the Weather Bureau at Washington; the *Climatic Charts for the Years 1870-99* show the normal precipitation for each quarter of the year, the normal percentage of sunshine, the normal barometric pressure, reduced to sea-level, the normal temperature of the air at the surface of the earth, the mean maximum and mean minimum temperatures, the highest and lowest recorded temperatures. In addition to these, charts of first and last frost and of prevailing winds have also been published. The ordinary popular textbooks on meteorology are very largely occupied with climatology, properly so called. Of these, that by Prof. Frank Waldo (New York, 1896) is probably the most complete for America; the treatises of Angot, *Traité élémentaire de météo-*

rologie (Paris, 1899) and Hann's *Handbuch der Klimatologie* (Stuttgart, 1893) are the most complete for European data. But in almost all respects, the most careful work of the kind ever published is entitled *Atlas of Meteorology*, vol. iii. of Bartholomew's *Physical Atlas* (London, 1899). In this we have a general text on climatology accompanied by about four hundred maps illustrating the climate and the weather of all parts of the globe for each month and for the whole year, and also an admirable bibliographical list of more important modern publications on this subject. A table of about forty columns of numerical data would seem to be necessary in order to present the complete idea of climate as imagined by Hann, in his great text-book on Climatology; but most of these are included in the plates and diagrams collected in Bartholomew's *Physical Atlas*.

Perhaps the most important feature controlling plant-life is the relative distribution of temperature and rain from month to month during the year. Climatic types have been elaborated by Harrington, Henry, and others, based upon this distribution of rain. Thus, in one region we have the prevailing summer rains; in another, the prevailing winter rains; while in still other places, the rains are divided into two seasons with dry weather between. Professor Hinrichs introduced the idea of a climatic distinction based upon the law governing the number of light and heavy rains that had fallen within a given space in a year's time. As the largest falls occurred least frequently, and so also the smallest falls, there is some intermediate rainfall that is most likely to happen. By counting up these different quantities, one obtains a series of numbers that may be represented by the equation of probabilities, and the constant term in this equation becomes the so-called 'Hinrichs Climatic Factor.'

The influence of climate on crops is a matter of continued investigation in the various agricultural experiment stations throughout the civilized globe, and the reader may refer to the *Experiment Station Record*, published regularly by the United States Department of Agriculture, for the latest information on the subject. A summary of this work has led some authorities to the conclusion that cereal crops are raised successfully only by means of careful special cultivation, so that the resulting crop is not so much an evidence of the influence of climate as of the influence of human skill and husbandry in modifying and assisting climate. In the interior of continents, the clear, dry air facilitates great ranges of temperature, both diurnal and annual; the soil is dry, evaporation rapid, and delicate plants do not survive the rigors of cold and drought. On the other hand, an oceanic or insular climate is more uniform as to temperature, moisture, and cloudiness, and more favorable to the development of animals and plants. The influence of climate in disease is principally secondary in that climatic conditions affect the growth of germs, fungi, and noxious animals, through which man suffers.

There is no well-authenticated case of an appreciable change of climate within the past two thousand years. The researches of Eginitis on the climate of Greece seem to establish this principle beyond doubt. Neither is it possible that any change on the surface of the earth due to

man—such as deforestation, reforestation, agriculture, canals, railroads, or telegraph lines—can have had anything more than the slightest local effect, if any, on climatic phenomena that depend upon the action of the whole atmosphere. On the other hand, it is probable that appreciable changes have taken place in the course of the very long intervals known as geological periods or æons. The phenomena of the flora, the fauna, the erosion, and the geological stratification, all agree in showing that there have been times when the Lake Region and the Saint Lawrence Valley, the Middle States and New England, were covered with ice and glaciers; a similar condition has prevailed over northwestern Europe. Such changes may have been produced by changes in the elevation of the land and distribution of the ocean, by periodic changes in latitude, by changes in the composition of the earth's atmosphere, or by changes in solar radiation. All of these are plausible causes; but at present there is no agreement of authorities as to the real cause of the changes in so-called geological climate. To these changes in the continents and the climates, we may plausibly attribute the development of a great variety of flora and fauna, the migratory habits of birds, the traditions of the early history of the human race, and the extinct plants and animals of paleontology. See EVOLUTION.

One of the most evident causes of the differences of climate is the relation of the wind to the land and ocean. When the prevailing wind is from the ocean, the land experiences moist and usually cloudy or rainy weather. This is due essentially not so much to the temperature of the water as to the mere fact that water of any temperature will evaporate largely into the air, and fill it with moisture. Thus, it is an error to say that the climate of Great Britain and western Europe is affected by the Gulf Stream, or that the climate of California and British Columbia is controlled by the Japan Current: in both these cases it is the moist ocean wind that brings cloud and rain, and the amount of this latter is not influenced in the slightest degree by the Gulf Stream or the Kuro Siwo. Another important consideration in climatology is the relation of the wind to the mountain ranges. Thus, on the windward side of a range, there is ascending air which causes damp weather with cloud or rain; whereas, on the leeward side of a mountain range there is descending air, which is always dry and clear, and frequently quite warm.

The relation of climate to physiography has been essentially a relation of cause and effect. The surface features of the land, as we now know them, present to us hills and valleys which we may easily recognize as the result of erosion by wind and water, continued for many ages, and assisted by frost and the varying hardness of the different kinds of rock and soil. These features, as we now see them, are usually all that remain after a depth of many thousands of feet of soil and rock has been broken down and carried into the sea. Geology tells us what strata and masses must, at one time, have existed; but physiography shows how 'all this material has been carried away by the action of the frost, wind, and rain, which constitute prominent features of the climate.

Among the works that treat of meteorological climate, the first place must be given to Bartholomew, *Atlas*, vol. iii. *Meteorology* (London,

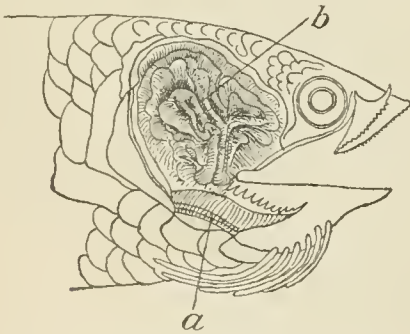
1899). For the United States specifically, consult the various publications of the Weather Bureau, and Waldo, *Elementary Meteorology* (New York, 1896). For the world in general, consult: Hann, *Handbuch der Klimatologie* (Stuttgart, 1897); Woeikof, *Die Klimate der Erde* (Jena, 1887); and Hann, *Lehrbuch der Meteorologie* (Stuttgart, 1901).

CLIMATOLOGICAL ASSOCIATION, AMERICAN. A society for the study of climatology, balneology, and the diseases of the respiratory and circulatory organs. It was organized in New York City in 1884, and is composed of physicians residing in the United States and Canada. It consisted, in 1901, of 133 members.

CLIMATOLOGY, CLIMATOGRAPHY. See CLIMATE.

CLIMBING FERN, or **HARTFORD FERN** (*Lygodium palmatum*). A species of fern found, rarely, from Massachusetts to Kentucky and southward, remarkable for climbing or twining around weeds and shrubs. The leaves are broadly palmate, and the fertile frondlets form a panicle upon the upper portion of the stem. It is prized for interior decoration of houses. For illustration, see Plate of FERNS.

CLIMBING FISH. One of the small Oriental fishes of the family Anabantidæ, interesting because of the modification of the upper portion of their branchial apparatus into a series of leaf-like structures, adapted for retaining small quantities of water. This water is sufficient to keep the gills moist for a considerable time, thus enabling the fish to subsist in mud or out of water. For a special account of this apparatus, consult Dobson, *Proceedings of the Zoölogical Society of London*, 1874, p. 312. The numerous species live in fresh water in southeastern Asia and its neighboring islands, and in South Africa. The



HEAD OF CLIMBING PERCH.

a, Gills; b, Leaf-like apparatus serving as air-breathing lungs.

best-known and typical species is the climbing perch (*Anabas scandens*), which is widely distributed in the Orient, and especially abundant in the Ganges valley. It is about six inches in length, somewhat resembles a perch, and has large scales and a spiny dorsal fin. It has been reported to climb palm-trees, but this needs verification. It often, however, leaves pools which are in danger of drying and travels over land in search of water, usually during the night or early morning, while the dew is still on.

CLIMBING HEMPWEED. See MIKANIA.

CLIMBING PLANTS. See LIANAS.

CLINCH. See KNOTTING AND SPLICING.

CLINCHANT, klän'shän', JUSTIN (1820-81). A French general, born at Thiaucourt (Meurthe). He studied at the military college of Saint Cyr, entered the infantry service in 1841, and fought in the Crimea, in the Italian campaign of 1859, and in Mexico. As commander of a brigade of the Third Army Corps, he participated in the battles before Metz. Having escaped from imprisonment after the capitulation, he was appointed to the command of the Twentieth Army Corps of the Army of the East, with the rank of a general of division. He succeeded Bourbaki (q.v.) as commander of the Army of the East, and, intercepted by the Germans under Von Manteuffel in an attempt at retreat, was compelled, with his 84,000 troops, to withdraw into Switzerland. He subsequently commanded the Fifth Army Corps of the Army of Versailles against the forces of the Commune, and in 1879 was appointed Military Governor of Paris.

CLINCHER. A 'prentice who apes the man-about-town in Farquhar's comedies, *The Constant Lover* and *Sir Harry Wildair*.

CLINCHER-BUILT, or **CLINKER-BUILT.** See BOAT.

CLINCH RIVER. A tributary of the Tennessee River, rising in Russell County, Virginia, and flowing in a southwestern direction through Virginia and Tennessee (Map: Virginia, B 5), joining the Tennessee River at Kingston. Its length is estimated at over 200 miles.

CLINEDINST, BENJAMIN WEST (1860—). An American illustrator, born at Woodstock, Va. He studied at the Virginia Military Institute (Lexington), and became known as an artist for periodicals and books. In oils and water-colors he has executed several portraits and genre pictures. He was awarded the Evans Prize of the American Water-Color Society in 1900.

CLINGMAN, THOMAS LANIER (1812-97). An American politician and soldier, born at Huntsville, N. C. He graduated at the University of North Carolina in 1832, and was elected to the State Legislature. From 1843 to 1858, with the exception of one term, he was a Whig member of Congress, where he became known as a brilliant debater. In 1858 he was selected by the Governor of his State to fill a vacancy existing in the United States Senate, whence, in 1861, he withdrew to become a colonel in the Confederate Army. He was promoted to be brigadier-general, served throughout the war, and in 1863 was a delegate to the National Democratic Convention. The existence in North Carolina of diamonds, rubies, corundum, platinum, and mica was first made known by him. He published *Follies of the Positive Philosophers* (1878) and a volume of speeches (1878).

CLINGMAN'S DOME. One of the two highest peaks of the Smoky Mountains, situated in Tennessee, just across the border from North Carolina (Map: North Carolina, A 4). It is 6613 feet above the sea-level. It was named after Thomas L. Clingman.

CLINIC (Lat. *clivnicus*, Gk. κλινικός, *klinikos*, pertaining to a bed, from κλίνη, *klīnē*, from κλίνειν, *klīneîn*, to incline). An institution or a department of a medical college, which is devoted to the examination and free treatment of patients. Notwithstanding the derivation of the

term, 'clinical' lectures have for many years been delivered, not at the bedside, but in lecture-rooms, to which patients are able to come from their homes. The term 'clinic' is often applied also to institutions where free medical treatment is furnished to patients who are able to walk in and return to their homes, but where there are no beds, as in a hospital. (See DISPENSARY.) The term *clinical medicine* is applied to the branch of medicine occupied with the investigation of diseases at the bedside.

CLINIC BAPTISM. In the ancient Church, baptism administered to a person on a sick-bed or death-bed. As such a baptism was irregular and the usual rites could not be observed, the question was discussed whether it was valid. In the third century Novatian declared that such baptized persons should not be ordained, and in 314 the Synod of Neo-Cæsarea so ordered, and this prohibition was renewed by the sixth Synod of Paris in 829. Saint Cyprian insisted strongly on the validity of such baptism.

CLINK, THE (Ger. *Klinke*, Dan. *klink*, Swed. *klinka*, bolt, latch, from Ger. *klingen*, OHG. *chlingan*, Dan. *klinge*, Swed. *klinga*, to clink, to jingle). An old prison at Bankside, London, in the jurisdiction of the Bishop of Winchester, used for criminals of that part of the Manor of Southwark which was known as 'The Liberty of Clink,' and not embraced in the original grant to the city of London (about 1327). The later grant was made expressly for the purpose of securing jurisdiction over the malefactors of the city of London who fled to Southwark. The name has come to mean the 'guard-house,' in the modern parlance of 'Tommy Atkins.'

CLINKER, HUMPHREY. The hero of Smollett's novel of the same name. He is brought up in a workhouse, and then enters the service of Mr. Bramble, his natural father.

CLINKER-BUILT. See BOAT.

CLINKERS (from *clink*, Ger. *klingen*, to jingle). The scales or globules of black oxide of iron, obtained from red-hot iron under the blows of a hammer. The same term is applied to the slag of iron-furnaces, to the calcined products of cement kilns, and, generally, to the slag-like refuse of furnaces of all kinds. The cinder-like masses which form the crust of some lava-streams are called clinkers by geologists.

CLINKSTONE. See PHONOLITE.

CLINOMETER (from Gk. *κλινειν*, *klinein*, to incline + *μετρον*, *metron*, measure; cf. Fr. *clinomètre*). An instrument used by geologists for ascertaining the dip or inclination from the horizontal of bedded rocks or veins. It consists of a graduated arc, with a pendulum or plumb-line hung at the centre. When the instrument is placed on a horizontal surface, the pendulum points to 0°, while on an inclined surface the pendulum assumes a position corresponding to the angle of inclination. The clinometer is sometimes attached to a compass, which latter is required for determining the direction of out-crop or strike of rocks.

CLINOSTAT (from Gk. *κλινειν*, *klinein*, to incline + *στατός*, *statos*, placed, from *στηναι*, *histanai*, to stand). An apparatus for rotating plants, periodically or constantly, in any desired plane, for the purpose of eliminating or equalizing the effect of any directive stimulus, such as

light or gravity. (See IRRITABILITY.) It consists essentially of a strong clockwork, driven by a spring or weight, with vanes or other device for controlling the speed of the mechanism, which may usually be adjusted to make one rotation in 10 to 30 minutes. Suitable tables and clamps for holding the vessel containing the plants are provided. The intermittent clinostat is so arranged that at given intervals the mechanism is released, and permitted to impart a quarter or a half rotation to the plant.

CLINT, ALFRED (1807-83). An English artist. He was born in London, and was the son of the well-known painter and engraver, George Clint. His work consists of portraits, and particularly studies of the scenery in Guernsey and Jersey, which have furnished the subjects for many charming landscapes. In 1869 he was made president of the Society of British Artists.

CLINTON. A town in Huron County, Ontario, Canada, 13 miles from Goderich, on a branch of the Grand Trunk Railroad (Map: Ontario, B 4). In and near the town are valuable salt-wells and a deposit of rock salt 20 feet thick. Clinton is the headquarters of the Canada Salt Association, has several factories, and a large trade in grain and produce. The town contains a collegiate institute and a model school, and is electrically lighted. The United States has a consular agent here. Population, in 1891, 2635; in 1901, 2547.

CLINTON. A city and the county-seat of Dewitt County, Ill., 22 miles south of Bloomington, on the Illinois Central Railroad (Map: Illinois, D 3). It is the centre of a fertile agricultural region. Clinton is governed, under a State law, by a mayor, elected for two years, and a city council. The city owns and operates its water-works. Population, in 1890, 2598; in 1900, 4452.

CLINTON. A city and the county-seat of Clinton County, Iowa, 138 miles west of Chicago, Ill.; on the Mississippi River, and on the Chicago and Northwestern; the Chicago, Milwaukee and Saint Paul; the Chicago, Burlington and Quincy, and other railroads (Map: Iowa, G 3). The Mississippi is crossed at Clinton by three bridges, one of which is three-fourths of a mile long. The city contains two academies, business colleges, and Wartburg College (Lutheran), founded in 1850. Its manufactures are extensive, including lumber in various products, machinery, boilers, carriages, flour, mattresses, spring beds, brooms, etc. Lumber and grain are largely exported. The city of Lyons, which in 1390 had 5799 inhabitants, was annexed to Clinton in 1895. Population, in 1890, 13,619; in 1900, 22,698.

CLINTON. A town in Worcester County, Mass., 12 miles northeast of Worcester; on the Nashua River, and on the Boston and Maine and New York, New Haven and Hartford railroads (Map: Massachusetts, D 3). It has manufactures of ginghams and plaids, machinery, wire-work, worsteds, Brussels and Wilton carpets, etc. The town owns and operates its water-works, and has a public library of 25,000 volumes, and a park. Clinton was a part of Lancaster until 1850, when it was incorporated as a separate town. Its government is administered by town-meetings, which are convened quite frequently. The board of selectmen, who are elected for three

years, appoint the chief of police, engineers, etc. Population, in 1890, 10,424; in 1900, 13,667.

CLINTON. A town in Hinds County, Miss., nine miles west-northwest of Jackson; on the Alabama and Vicksburg Railroad. It is the seat of Mississippi College (Baptist), organized in 1852; of Hillman College, established in 1853; and Mount Herman Seminary for colored students. Population, in 1900, 354.

CLINTON. A city and the county-seat of Henry County, Mo., 90 miles southeast of Kansas City; on the Missouri, Kansas and Texas, the Saint Louis and San Francisco, and the Kansas City, Clinton and Springfield railroads (Map: Missouri, C 3). It has potteries, flour-mills, and iron-rolling mills, and exports hogs, cattle, coal, and agricultural products. There is an artesian well, which has a considerable flow of white sulphur. Baird College is situated there. Settled in 1835, Clinton was incorporated as a village in 1840, and at present is governed under a general law, revised in 1899, which provides for a mayor, who holds office for two years, and a city council. Population, in 1890, 4737; in 1900, 5061.

CLINTON. A village in Oneida County, N. Y., nine miles west-southwest of Utica; on Oriskany Creek and on the New York, Ontario and Western Railroad (Map: New York, E 2). It is the seat of Hamilton College (q.v.), Houghton Seminary, and the Clinton Preparatory School. There are mineral-springs here. Iron-mining and smelting are the leading industries. Population, in 1890, 1269; in 1900, 1340.

CLINTON, DE WITT (1769-1828). An American statesman. He was born at Little Britain, Orange County, N. Y., March 2, 1769, the son of James Clinton, and was educated at Columbia College, graduating with high honors in 1786. Choosing the law for his vocation, he studied under Samuel Jones, and was admitted to the bar in 1788. He entered immediately into political life, opposing the adoption of the Federal Constitution, and becoming an ardent supporter of his uncle, George Clinton (q.v.), who was then Governor of the State, and a leader of the Anti-Federalist Party. In 1797 he was elected to the State Assembly as a representative of New York City, where he made his residence, and the next year was chosen State Senator for four years. He also became a member of the Council of Appointment. Up to this time the Governor had exercised the exclusive right to make nominations; but Clinton vigorously attacked the system, succeeded in 1801 in procuring an amendment to the Constitution giving the members of the Council of Appointment equal rights of nomination with the Governor, and by this means introduced the 'spoils system' into New York politics. During this period he found time to devote himself to scientific and social questions—especially the use of steam in navigation, and the abolition of slavery and its kindred barbarism, imprisonment for debt. In 1802, when but thirty-three years of age, he became a member of the United States Senate, but soon resigned to accept the office of Mayor of New York—an appointment made by his uncle, the Governor, and the Council of Appointment; and this position he held, with two short intermissions, until 1815. While Mayor, he was also at various times State Senator, a member of the Council of Appointment, a

commissioner on the Erie Canal route, and from 1811 to 1813 Lieutenant-Governor of the State. After the retirement of his uncle from active participation in State politics in 1804, he speedily became the leader of the Republican Party in New York, and in 1812 was chosen as its candidate for President. Madison was nominated by the Republican Congressional Caucus; but the New York section of the party, tired of Virginian control, insisted on running Clinton, and made a coalition with the Federalists for that purpose. Clinton, however, received only 89 electoral votes to 128 for Madison. The canvass had been hardly creditable to Clinton, and he was not henceforth an important figure in national politics; but as a great benefactor of his State in his later years, he won fame and success. He took a leading part in establishing the free-school system of New York City, and in the establishment and promotion of various institutions of science; in the improvement and modification of criminal laws; in the extension of agriculture and manufactures; in the relief of the poor, and the improvement of morals. But his greatest service was his promotion of the Erie Canal project. As citizen and commissioner, his zeal, energy, and optimism in planning and urging on the completion of this great waterway inseparably connected his name with the enterprise, both in the minds of its friends and in the minds of those who sneered at 'Clinton's Folly.' The canal became a political question, and on this issue Clinton was elected Governor in 1817. One of his first duties as Governor was to break ground for the canal at Rome. He was reelected in 1820, but declined a hopeless nomination in 1822. His political opponents, led by Martin Van Buren and the 'Albany Regency' (q.v.), sought to end his political career, and in 1824 removed him from the office of canal commissioner. This partisan act provoked a storm of public indignation, which elected Clinton Governor in that year—an office which he held until his death. The next year he opened the Erie Canal. He died suddenly, February 11, 1828, at Albany. Among his works are: *Discourse Before the New York Historical Society; Memoir on the Antiquities of Western New York; Letters on the Natural History and Internal Resources of New York; Speeches to the Legislature*, and many historical and scientific addresses. Consult: *Lives*, Hosack (New York, 1829) and Renwick (New York, 1840); also Campbell, *Life and Writings of De Witt Clinton* (New York, 1849).

CLINTON, GEORGE (1739-1812). An American statesman, born in Little Britain, N. Y. In the French and Indian War he served as a lieutenant in the expedition against Fort Frontenac, and after the war entered law and politics. He was chosen to the Colonial Assembly and to the Continental Congress, was made brigadier-general in the Revolutionary Army, and in 1777 was elected first Governor of New York. He was reelected and occupied the executive chair for eighteen years, and in 1801 was chosen for one more term. From 1805 until his death he was Vice-President of the United States. While Governor, his discretion in civil affairs and his military services were of great value to the State. He opposed the ratification of the Federal Constitution in the belief that it granted too great powers to the national officers, and while presid-

ing officer of the Senate, during his term as Vice-President, defeated by his deciding vote the rechartering of the United States Bank (1811).

CLINTON, Sir HENRY (c.1738-95). A British general in the American Revolution. He was the son of Admiral George Clinton (Governor of Newfoundland from 1732 to 1741, and of New York from 1741 to 1751), and the grandson of Francis, sixth Earl of Lincoln. He was a member of Parliament for Boroughbridge and Newark from 1772 to 1784, during which time he was also in the army in America. He served as major-general at the battle of Bunker Hill, and took possession of New York after the defeat of Washington's forces in the battle of Long Island (August 27, 1776). For his part in that battle he was promoted lieutenant-general and knighted. In 1778 he succeeded Sir William Howe as commander-in-chief, and, on his march from Philadelphia to New York, fought with Washington the unsuccessful battle of Monmouth (q.v.). In December, 1779, he led an expedition to South Carolina, and on May 12, 1780, captured Charleston, with General Lincoln's army of 6000 men. Replaced in command by Sir Guy Carleton in 1782, Clinton returned to England. Soon afterwards he published his *Narrative of the Campaign of 1781 in North America* (1783), in answer to an account which Cornwallis had published of that campaign. He was again in Parliament (1790), and from 1793 until his death was Governor of Gibraltar.

CLINTON, HENRY FYNES (1781-1852). An English classical scholar, born at Gamston, in Nottinghamshire. He graduated at Oxford in 1805, and was a member of Parliament from 1806 to 1826. His two great works are the *Fasti Hellenici* (1824-34), and *Fasti Romani* (1845-50), the civil and literary chronologies of Greece, Rome, and Constantinople, which set classical chronology upon a solid and scientific basis. Consult *The Literary Remains of Henry Fynes Clinton*, by his brother (London, 1854).

CLINTON, JAMES (1736-1812). An American soldier, born in Ulster County, N. Y. He was a brother of George Clinton (1739-1812), and the father of De Witt Clinton. He early entered the English Army; served as a captain in the French and Indian War, and distinguished himself at the capture of Fort Frontenac. On the outbreak of the Revolution, he took the side of the Colonies and was made a colonel. He accompanied Montgomery to Quebec as brigadier-general, and in 1777 was in command of Fort Clinton when it was captured by the British, after a brilliant defense, in which he received a bayonet wound. He was engaged against the Indians in General Sullivan's Iroquois expedition (1779), and was present at the siege of Yorktown. He was delegate to the New York Convention which ratified the Federal Constitution, and was afterwards a commissioner to adjust the boundary line between Pennsylvania and New York.

CLINTON STAGE. A name given to a subdivision of the Silurian system. The Clinton stage takes its name from the type locality at Clinton, N. Y.; but the strata are widely distributed in the eastern part of the United States, occurring along the Appalachians from New York to Alabama, and also in Ohio, Indiana, and Wisconsin. The prevailing rocks are sand-

stones, limestones, and shales, which attain a maximum thickness in the aggregate of about 1000 feet. A noteworthy feature of the Clinton stage is a persistent bed of oolitic iron ore that is the basis of an active mining industry in New York and Alabama. See article SILURIAN SYSTEM.

CLINTON STATE PRISON. A prison located in Dannemora, Clinton County, N. Y. It was begun in 1844, and comprises a number of buildings inclosed in a stockade which surrounds thirty-seven acres of land. This location was chosen for the purpose of employing convicts in the mining and manufacture of iron, there being abundance of that ore on the tract belonging to the prison or to the State. It is also in a densely wooded region, and the timber furnishes the charcoal used in the furnaces.

CLIO (Lat., from Gk. Κλειῶ, *Kleiō*, from κλείν, *klein*, to celebrate, from κλέος, *kleos*, glory). In Grecian mythology, one of the Nine Muses (q.v.). When the individual muses were assigned specific functions, Clio was at first called muse of epic poetry, but later, and more commonly, muse of history. In ancient art her common attribute is a partly opened roll.

CLIO. A prominent genus of pteropod mollusks. See PTEROPODA.

CLIO. A pen-name of Addison, suggested by the letters 'C' 'L' 'I' 'O' with which, respectively, he signed his articles in the *Spectator*, according as he wrote at Chelsea, London, Islington, or 'The Office.'

CLIP HOOKS. Two hooks, with points lying in opposite directions, made in such a manner that they overlap and fit closely so as to form a single eye when the necks are lashed together; the eyes of the separate hooks are in the same thimble or on the same pivot, and also fit closely to each other when the necks are brought together.

CLIPPER (probably connected with Dutch *klepper*, fast horse, from *kleppen*, to run swiftly, and thus with Eng. *clap*). A sailing vessel built with very sharp lines, more or less raking masts, and great spread of canvas, with a view to speed; a development of a model for the mercantile marine, first built in this country at Baltimore, and called the *Baltimore Clipper*. The clippers, becoming famous for quick runs, and occasionally making better time than the steamers, were especially employed in the South American trade, in the China trade (for tea and opium), and in the early California trade, via Cape Horn. For many years the 'fruit clippers' were celebrated for their rapid passages; and the 'opium clippers' and 'slavers' attained an unenviable notoriety for speed. A 'clipper ship,' as compared with the ordinary sailing ship, is longer, and generally of less beam in proportion to her length; very sharp at the bows, which are hollowed more or less below the water-line; gracefully fined away toward the stern, which is almost always



CLIP OR SISTER
HOOK.

elliptical; and, in fact, the comparison of the race-horse to the beast of burden holds good in comparing the clipper to the ordinary sailing ship. The first American clipper was the *Rainbow*, a vessel of 750 tons, built in 1843 for the China trade. The largest of these craft was the *Great Republic*, 325 feet in length, 53 feet beam, and 37 feet depth of hold, of 4000 tons capacity. The Aberdeen builders and Mr. Scott Russell, in England, built some of the most magnificent clipper ships that have sailed the ocean. Among the fastest passages are those made by the *Flying Cloud* in 1851, New York to San Francisco in 89 days and 18 hours, making 374 miles in one day. This record, however, was reduced by the *Comet*, which made the same trip in 83 days; in 1854, by the *Lightning*, Boston to Liverpool, 2827 miles, in 13 days, and Melbourne to Liverpool, 12,190 miles, in 64 days; in 1865, by the *Nightingale* from Melbourne to New York, 12,720 miles, in 73 days; the *Thornton*, Sandy Hook to Liverpool, 3000 miles, in 13 days, 9 hours; this record was equaled by the *Dreadnaught* in 1859; 1869, the *Golden Gate*, an iron clipper ship, from Liverpool to San Francisco, 13,800 miles in 100 days. The clipper, which was at its prime during the period from 1840 to 1855, at the advent of the steamship underwent numerous transformations as the ends of commerce demanded a greater cargo-carrying capacity at the expense of speed, and as a type gradually passed away; changes were made in the lines and rig, and smaller crews were carried, with the object of increasing tonnage capacity and competing with steamships by lower freight-rates. The effect of the model, however, was shown in many subsequent ships and yachts.

CLIPPER-BOW. The overhanging bow, with short bowsprit (chiefly ornamental), which is found in some wooden steamers. The bow of most steamers has a vertical stem. The clipper-bow differs from the old sailing-ship bow in rising in a smooth curve from the cutwater to the scroll-head, while the latter had a reverse curve as it approached the bowsprit.

CLISTHENES, klis'thē-nēs (Lat., from Gk. Κλεισθένης, *Kleisthenēs*). An Athenian statesman. He was a member of the celebrated family of the Alæmonidae, and grandson of the Sicyonian Clisthenes. He took a prominent part in the expulsion of Hippias in B.C. 510. He made important changes in the Athenian Constitution, which he rendered more democratic. The basis of his reform was a redistribution of the people; instead of four tribes, or phylæ, which had previously existed, he made the number ten, and distributed among these the demes into which the Attic territory was divided. He also instituted ostracism, and was the first to suffer therefrom. When Isagoras, the head of the oligarchical party at Athens, called in Cleomenes, King of Sparta, Clisthenes, with 700 heads of families, was forced to retire from the city, but was afterwards recalled.

CLITANDRE, klē'tān'dr'. A favorite name with Molière, who calls four different characters by it: (1) The sensible lover of Henriette in *Les femmes savantes*. (2) The lover of Angélique in *Georges Dandin*. (3) A titled lover of Célimène in *Le misanthrope*. (4) The lover of Lucinde in *L'amour médecin*, who pretends to be a physician in order to cure her.

CLITH'EROE (Welsb *Cled-dwyr*, cliff near the waters). A town of Lancashire, England, on the Ribble, and at the foot of the Pendle Hills, about 28 miles north of Manchester (Map: England, D 3). Its notable buildings include the Church of Saint Michael's, the ancient grammar-school founded by Queen Mary in 1554, and the ruins of an old castle built by one of the De Lacy family in the twelfth century. The town maintains a free public library, and expends a considerable sum on technical education. Its industries consist of cotton and paper mills, and in the neighborhood are extensive limestone-quarries. Near Clitheroe is the Jesuit College of Stonyhurst. Population, in 1891, 10,800; in 1901, 11,400. Clitheroe and Pontefract were the two seats of the De Lacy family in Norman times.

CLITOM'ACHUS (Gk. Κλειτόμαχος, *Kleitomachos*, or possibly Κλειστόμαχος, *Kleistomachos*) (c.190-c.110 B.C.). A Greek philosopher of the New Academy. The most important among the pupils of Carneades, whose spoken philosophy he put in writing, and whom he succeeded as leader of the school. He was a Carthaginian by birth; was called Hasdrubal in his own tongue; came to Athens about 147, and became head of the New Academy in 129. Of his many works none remain save in translations given by Cicero, who praises Clitomachus highly. He was well known at Rome, if we are to believe Cicero's statement that Crassus heard him lecture at Athens in 111, and that he dedicated one of his books to the poet Lucilius and one to Lucius Censorinus, consul in 149 B.C.

CLIT'US (Lat., from Gk. Κλείτος, *Kleitos*) (?-B.C. 328). The foster-brother of Alexander the Great. He was the dearest friend of the King, whose life he saved at the battle of the Granicus. He held high positions in the Macedonian armies, and in 328 was made satrap of Bactria. At a banquet given by Alexander in honor of the Dioseuri, the King, goaded to madness by the censures of Clitus, who reproached Alexander with slothfulness, seized a spear, and in his drunken rage slew him. Alexander bitterly repented his death, and showed his grief in the most extravagant manner.

CLITUS. In Shakespeare's *Julius Cæsar*, the servant of Brutus, who appears only in Act v. Scene 5, and who refuses to hold the sword for his master to fall upon.

CLIVE, CATHERINE (1711-85). A noted English actress, familiarly called 'Kitty Clive.' She was a daughter of William Raftor, an Irish gentleman of reduced circumstances, living in London. There is a doubtful story about her having been overheard singing while scrubbing a doorstep where there were some members of the Beef-steak Club, and so securing a chance to begin her career. At any rate, during Colley Cibber's management of Drury Lane, she made her appearance there as a page, with a song, in Lee's tragedy of *Mithridates*, probably in 1728. She made a great hit, which she repeated in 1729 as Phillida in Cibber's *Love in a Riddle*. About 1732 she was married to George Clive, second cousin of the famous Lord Clive. In 1742 she sang the part of Delilah in Handel's *Samson*, then first produced. She left Drury Lane in 1743, during Fleetwood's management, but resumed her connection with that theatre when Garrick took its direction, three years later. Her

last appearance was in 1769, as *Violante* in the comedy of *The Wonder*, Garrick himself, out of compliment to her, taking the part of Don Felix. Mrs. Clive's talents were seen to best advantage in comic parts, to which, however, she was not always satisfied to restrict herself. Her vigorous wit and sound sense made her the welcome companion of some of the notable people of her time. In her later life she was an intimate friend of Horace Walpole, who gave her a house at Strawberry Hill. She died December 6, 1785, and was buried at Twickenham. Consult: Fitzgerald, *Life of Mrs. Catherine Clive* (London, 1888); Austin Dobson, in Matthews and Hutton, *Actors and Actresses of Great Britain and the United States*, vol. i. (New York, 1886); Doran, *Annals of the English Stage* (London, 1888).

CLIVE, ROBERT, Baron Clive of Plassey (1725-74). An English general, whose achievements laid the foundations of the British Indian Empire. His father, a lawyer and small land-owner, came of an ancient Shropshire family, whose manor-seat, Styche, near Market Drayton, dates from the reign of Henry II. There Clive was born September 29, 1725, the eldest of thirteen children. He spent several years with an uncle at Hope Hall, near Manchester, and at various schools showed more aptitude for pugilism, pluck, and mischievousness than for study, although one of his masters predicted his future celebrity. At eighteen years of age he shipped to Madras as a writer to the East India Company. The ship, driven out of its course to Brazil, was detained there for nine months, which Clive utilized by learning Portuguese, a language of service to him during his Indian administration. After his arrival in Madras the climate and monotonous drudgery of his duties made him unsuccessfully attempt suicide. But with the outbreak of the great struggle between the French and English in India his opportunity came. He applied for and obtained an ensign's commission, and distinguished himself in Boscawen's unsuccessful siege of Pondicherry in 1748. His dauntless courage, previously exhibited in a duel which forms the idealized subject of Browning's poem "Clive," now had scope for development. English influence was almost extinct in India, through the prestige of the French and their allies. In 1751, with 500 mixed English and Sepoy troops, Clive marched from Madras and captured Arcot, a city of 100,000 inhabitants, garrisoned by 1500 of Chunda Sahib's best troops. The daring displayed in the capture of Arcot was equalled by the intrepidity and fortitude exhibited in its successful defense by Clive and his little band, reduced to 200 men, against a besieging army of 7000 natives and French, and impressed the natives with the strength and prowess of Britain. The succeeding campaign, in which successes and personal escapes were of a most dramatic character, included the victories of Arni and Kaveripak, and the capture of Kovilam and Chingalpat. Henceforward Clive's name was a local tower of strength; the natives sur-named him 'Sabat Jung' or 'the Daring in War'; and Pitt described him as "the youth of twenty-seven years" who had done the deeds of a "heaven-born general." In 1753, with his bride, Margaret Maskelyne, sister of the astronomer, he visited England, and received a diamond-hilted sword and the warm thanks of the India Company. Possessed of a moderate fortune, ob-

tained from prize-money, he expended part in redeeming the paternal estate, and relieving his father from pecuniary embarrassment. The rest soon disappeared in an unsuccessful Parliamentary contest and the maintenance of a costly establishment. He returned to India in 1755, and in 1756 was called to avenge the Black Hole atrocity perpetrated by Siraj-ud-Daula, Nawab of Bengal. Clive advanced against the Nawab, and in January, 1757, the English were again in possession of Calcutta. A peace was arranged; but Clive, bent upon a brilliant exhibition of his powers, and eager for the riches of Bengal, soon returned to the struggle. To insure his success, he entered into a plot for the elevation to the throne of Bengal of Siraj-ud-Daula's general, Mir Jafir, who was to desert his chief, and who promised to shower wealth on Clive and the East India Company for his services. On June 23, 1757, Siraj-ud-Daula was overthrown in the battle of Plassey. This victory decided the ascendancy of England over France in India, and was followed by the rapid building up of a British Indian empire. Mir Jafir was placed upon the throne of Bengal, and kept his promises. From shares in these and other spoils, and from presents and territorial grants from native princes, Clive amassed vast wealth, which yielded an annual income of £40,000. After managing the affairs of the East India Company at Calcutta for some years, and winning fresh victories, he returned to England in 1760, and was loaded with thanks and honors. He became Parliamentary member for Shrewsbury, was raised to the Irish peerage as Baron Clive of Plassey, and in 1764 was created Knight of the Bath. Through the dishonesty of its servants, high and low, the affairs of the Company became greatly involved after his departure from India, and in 1765 he was sent out to set them right. He proved as competent an administrator as a warrior; and in less than eighteen months, by his uncompromising and resolute attitude, "restored perfect order and discipline in both the civil and military services, and brought back prosperity to the well-nigh ruined finances of the Company." He returned to England in 1767, and was received with the distinction to which he was entitled. But the energy he had displayed in righting Indian affairs antagonized many who suffered pecuniarily from the suppression of dishonest practices; and they, possessing influence, employed it in raising English feeling against Clive. His Indian administration was made the subject of animadversion in Parliament in 1772, which he at first ignored, but subsequently replied to in a vigorous and eloquent speech, which elicited Pitt's admiration. A Parliamentary inquiry, the following year, failed to find that Clive had acquired wealth by abuse of power; and the only questionable incident in his government was proved to be a trick to match Oriental duplicity. At some of the supposedly incriminating evidence, Clive indignantly asserted himself with the celebrated exclamation, "By God, Mr. Chairman, I stand astonished at my own moderation!" A qualified acquittal, which acknowledged his "great and meritorious services," was not satisfactory to Clive, who never recovered from the disgrace implied in the trial; this, with sickness, recourse to opium to alleviate his sufferings, and mental depression, led to his suicide, November 22, 1774.

Consult: Malcolm, *Life of Clive* (3 vols., Lon-

don, 1836); Malleon, *Founders of the Indian Empire: Lord Clive* (London, 1882); Malleon, *Decisive Battles of India* (London, 1883); Mill, *History of British India*, vol. iii. (London, 1858); Orme, *History of the Military Transactions of the British Nation in Indostan* (London, 1803); Macaulay, *Essay on Clive* (London, 1840).

CLOACA, klô-â'kâ (Lat., sewer). The *cloaca* or drains were subterranean passages, usually built of stone, devised to carry off the spring or waste water and the refuse of a Roman city. In Rome the early city was naturally drained by streams running through three valleys between the hills. Three main channels were built to confine these streams, receive the drainage, and carry it to the Tiber. The largest of these, crossing the Argiletum, Forum, and Velabrum, was called, from its size, the Cloaca Maxima, though that of the Vallis Murcia and that near the Circus Flaminius rival it in size and solidity. A network of smaller passages empty into these main channels. The system was largely due to the Tarquins. The Cloaca Maxima was built with three large arches, one within the other. The space inclosed by the innermost vault was upward of 13 feet in width, and of corresponding height. The arches were built of large blocks of stone, fixed together without cement, of the uniform size of rather more than five feet five inches long and three feet high. The flooring is paved like a Roman road, and the side walls are built of Gabii stone, in blocks measuring sometimes 45 cubic feet. The sewer was kept in a state of efficiency by a continuous stream of superfluous water from the aqueducts. Large portions of the cloacæ remain in some places still visible, but generally buried by the accumulation of soil, at a considerable depth below the present level of the streets. The mouth of the Cloaca Maxima at the Tiber is still visible. During the Republic the surveillance of the Roman cloacæ was one of the duties performed by the censors. The Cloaca Maxima was repaired by Cato and his colleagues in the censorship. Agrippa, when edile, obtained praise for his exertions in cleansing and repairing the cloacæ, and is recorded to have passed through them in a boat. Under the Empire, officers called *curatores cloacarum urbis* were appointed for their supervision. So thoroughly was the city undermined by these large sewers that Pliny calls it *urbs pensilis*, a city suspended in the air rather than resting upon the earth. Drains of the same description, but of smaller dimensions, existed in other ancient Roman cities.

CLOCHES DE CORNEVILLE, LES, lâ klôsh' de kôr'n'-vêl'. A very popular operetta, in three acts, produced at the Folies Dramatiques in 1877. The amusing libretto is by Clairville and Charles Gabet, the music, from which many airs have become popular, by Robert Planquette.

CLOCK (AS. *clucge*, Icel. *klukka*, Ger. *Glocke*, bell, from ML. *clocca*, bell, from OIr. *clocc*, Ir. Gael. *clog*, bell, clock, Welsh, Corn. *cloch*, Manx *clugg*, bell). A mechanical instrument for measuring and indicating the time of day, usually by a mechanism consisting of two distinct portions: First, a train or succession of toothed wheels for transmission to a definite point of a motive force, produced by a weight or spring; and, second, an escapement to regulate the expenditure of this

motive force with uniformity and requisite slowness. A watch is simply a portable clock, to be worn on the person, in which the motive force is a spring. A marine chronometer is a watch of unusual size, constructed and mounted with especial care, for determining longitude at sea. See WATCH; CHRONOMETER.

HISTORICAL DEVELOPMENT. Among the predecessors of the clock, as time-measurers, are the sun-dial, the clepsydra or water-clock, and the hour-glass. (See DIAL; CLEPSYDRA; HOUR-GLASS.) The clepsydra was a graduated transparent vase, in which water trickled through a hole in the bottom at such a rate that the receding water marked the passage of time. In the hour-glass sand was substituted for water. Among Eastern nations a great many curious mechanical devices were introduced into the construction of the clepsydra: the water was made to flow in tears from the eyes of automata; a floating statue, falling with the liquid, pointed to the passing hours, as indicated on the side of the glass; finally, a mechanism was introduced by which the water, as it fell, drop by drop, turned a little wheel, which moved the hands on the face of a dial, and so marked the hour. The next step was the construction of a time-indicator, whose hands were moved by the action of falling weights instead of that of falling water. When this step was taken, and the first true clock constructed, is uncertain. Its invention is claimed by many peoples, from the Chinese, B.C. 2000, to the Germans of the eleventh century. Certain it is that clocks were in general use in churches and monasteries throughout the latter part of the Middle Ages, and that these ancient tower-clocks were the progenitors of all our modern timekeepers.

The oldest clock of which we have a complete description was set up in the tower of the palace of Charles V. of France, in 1379, by a German named Henry De Vick. This primitive clock was constructed on the mechanical principle which is the basis of all modern timekeepers. This principle, as formulated by E. A. Marsh, is "that the power stored up in a raised weight or coiled spring shall be communicated to a train of wheels which are set revolving, and that the force or motion shall be cut up into a succession of minute but equal impulses by converting a rotary into a vibratory motion. The last and quickest wheel of the train shall have its teeth so formed that they are caught and escape alternately, and hence the wheel is called the 'scape-wheel,' and, from its resemblance to a crown, the 'crown-wheel.' The bar and staff, which, with its projections, catch and release the teeth, is termed the 'escapement,' and it is through this device that the rotary is converted

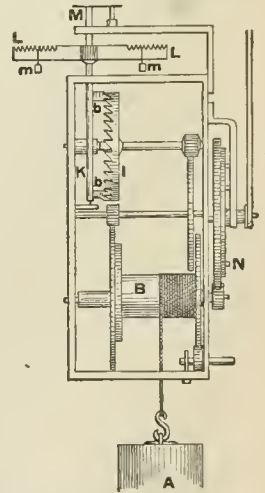


FIG. 1. MECHANISM OF DE VICK'S CLOCK.

into the backward and forward motion." The accompanying sketch of De Vick's clock is useful not only from its historical interest, but also because, from its comparative simplicity, it will form a groundwork for further explanation of the mechanism of clocks in their more complicated form. It will be readily understood, from a glance at the annexed figure (Fig. 1), that as the weight A tends to uncoil the cord and set in motion the cylinder B round its axis, the motion will be successively communicated to the various toothed wheels in the figure, and finally

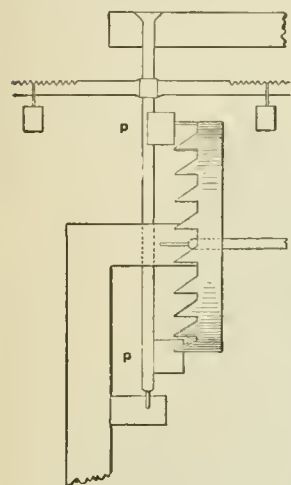


FIG. 2. BALANCE AND ESCAPEMENT OF THE FIRST CLOCK. P P, Pallets.

it is manifest that the heavy weight A would go rapidly to the ground, causing the wheels to rotate, the balance to vibrate, and the hands to go round with increasing velocity. In order to prevent this rapid unwinding of the clockwork, and adjust it to the more deliberate measurement of time, the balance is, in De Vick's clock, loaded with two weights, *m, m*;

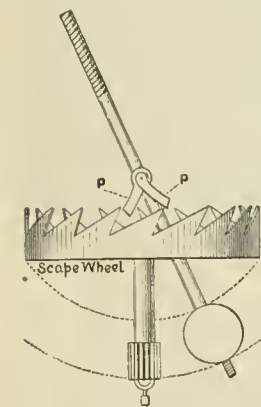


FIG. 3. DE VICK'S OLD BALANCE CONVERTED INTO THE PENDULUM. p p, Pallets.

known as its *isochronism* (q.v.) constitutes its value to clock-mechanism—that, when a suspended body is swinging, any increase or

to the crown-wheel or escapement-wheel, I; the teeth of which so act on the two small levers or pallets, *b b*, projecting from and forming part of the suspended upright spindle or vertical axis, KM, on which is fixed the regulator or balance, LL, that an alternating or vibratory instead of a circular motion of the balance itself is the result. The hands of the clock are attached to the wheel N, also set in motion by the cylinder B. Now, unless there were some check upon the motion,

and the farther these are removed from the axis or spindle, KM, the more heavily they will resist and counteract the escapement of the levers, and the rapidity of the rotation of the escapement-wheel, till the clock be brought to go neither too quick nor too slow.

Upon this simple plan it is probable that all clocks were constructed until the seventeenth century, when the principle of the pendulum was applied to the science of horology. The property of a pendulum

decrease in its speed will not change the number of vibrations it makes in a given time, but only the length of the arc it describes. This law of the pendulum was discovered by Galileo, and was first applied (probably) to clockwork by Huygens, about 1657. The two accompanying cuts show how the horizontal swing of the balance, as maintained in De Vick's clock, was converted into the vertical swing of the pendulum. By taking off one of the weights and hanging the balance in an upright position, it becomes a pendulum. Ten years later Dr. Hooke invented an escapement which enabled a weaker support to carry a heavier pendulum. Subsequent improvements in the escapement and pendulum (see ESCAPEMENT; PENDULUM), and in the use of the spring (see WATCH) in place of the pendulum, have brought the mechanism of timekeepers down to the present degree of perfection.

STRIKING APPARATUS. The principal function of a clock, according to the mediæval conception, was that it should be a reliable instrument for automatically calling out the hours, particularly the hours for devotion. This conception of the clock is shown in the word itself, which originally meant 'bell'—a meaning which has been retained in the French word *cloche*. A striking apparatus was, therefore, early invented, and it is interesting to note that the striking mechanism of De Vick's clock is similar to that used in some modern timepieces. A striking clock contains one or more extra trains of wheels to control the striker. In De Vick's clock twelve pins projected from the wheel on which the hand was attached. At each hour one of these pins, by pushing a lever, released the striking-train, which lifted the hammer that strikes the bell. The number of strokes was determined by the position of the notches around the edge of a locking-plate, which held the lever controlling the striking-train. These notches were so placed that at one o'clock the catch in the lever entered a notch as soon as one blow had been struck. At two o'clock there was a longer space before the notch was reached, so that the bell was struck twice; at three o'clock the bell struck three times before the train was locked, and so on. The chief objection to this striking apparatus is that it is thrown out of order and strikes wrong every time the clock happens to run down.

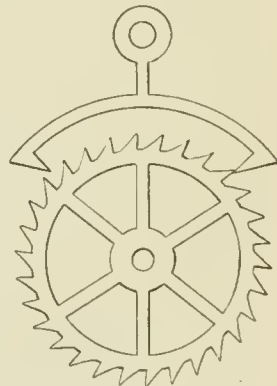


FIG. 4. DR. HOOKE'S ESCAPEMENT.

The *rack and snail repeating mechanism* has been used for two centuries. It is a peculiar and intricate piece of mechanism. In ordinary clocks, the impelling power is a weight similar to that which moves the time-measuring mechanism itself; but the pressure of this weight on the striking machinery is only permitted to come into play at stated periods in course of the workings of the timekeeping apparatus—viz. at

the completion of every hour; when the minute-wheel, which revolves once in an hour, and carries the minute-hand of the clock along with it, brings it into action by the temporary release of a catch or detent, permitting the weight wound up on the cylinder of the striking apparatus to run down a little, in doing which the hammer is forced into action, so as to strike the bell. Whether the strokes shall be one or many is determined principally by two pieces of mechanism, one called a 'snail,' from its form or outline, with twelve steps, and the other a 'rack,' with twelve teeth. The time during which the striking-weight is allowed to descend varies according to the turning of the twelve steps of the snail on its axis, and the position of the twelve teeth of the rack at different hours of the day, being sometimes only long enough to permit one blow to be given by the hammer on the bell, and at another time long enough for twelve such blows.

It is not known when the alarm or when the striking mechanism of the clock was first applied. The alarm was adopted for the use of the priesthood, to arouse them to their morning devotions. The first striking clock probably announced the hour by a single blow, as they still do, to avoid noise in churches. During the seventeenth century there existed a great taste for striking clocks, and hence a great variety of them. Several of Tompion's clocks not only struck the quarters on eight bells, but also the hour after each quarter; at 12 o'clock 44 blows were struck, and between 12 and 1 no fewer than 113. Many struck the hour twice, like that of Saint Clement Danes, in the Strand, London. Before the fifteenth century chimes had been introduced. (See CHIMES; also an article in the *Journal of the Society of Arts* (London, March 29, 1901), on "Clocks, Carillons, and Bells.")

CLOCKS PROVIDED WITH AUTOMATONS. The desire to construct clocks which shall perform automatically many other things besides simply recording the time of day is as old as clockmaking, and was developed to a wonderful degree in the ancient clepsydre of Oriental nations. Indeed, the automatons of the ancient Chinese and Arabian clocks were the models upon which all those of mediæval Europe, including the famous Strassburg clock, were based. Among the earliest of these automatons or 'jacks of the clock' built in the tower-clocks of Europe were those of the clocks at Dijon, Cambrai, and Linden, in each of which two figures appear and strike the hourly bell. In 1495 the clock at Lübeck was built in which the figures of the Twelve Apostles were introduced.

Probably the most widely known of these tower-clocks is the one in Strassburg Cathedral. This famous clock has been reconstructed twice. The first Strassburg clock was built in 1352, under the direction of John, Bishop of Liechtenberg. It contained a calendar, an astrolabe, and a set of chimes composed of several cymbals. There were automatic figures of the Virgin, of the three Wise Men who bow before her, and a cock, which moves its beak, crows, and flaps its wings. The second Strassburg clock was built in 1570. Its mechanical works were constructed by Isaak and Josias Habrecht, of Schaffhausen, Switzerland. Early in the nineteenth century it was found that the clock required reconstruction, and the task was consigned to Charles

Schwilgué, who consumed four years in its completion. Only a few of the original movements were restored by Schwilgué, most of the present mechanism being of his own design.

The following description of the present Strassburg clock indicates its most important features: It is 30 feet high and 15 feet at the base. On one side of the main portion is a flight of winding stairs, surmounted by five columns. On the other side is a Gothic pillar, the panels of which are filled with figure paintings. At the base of the main

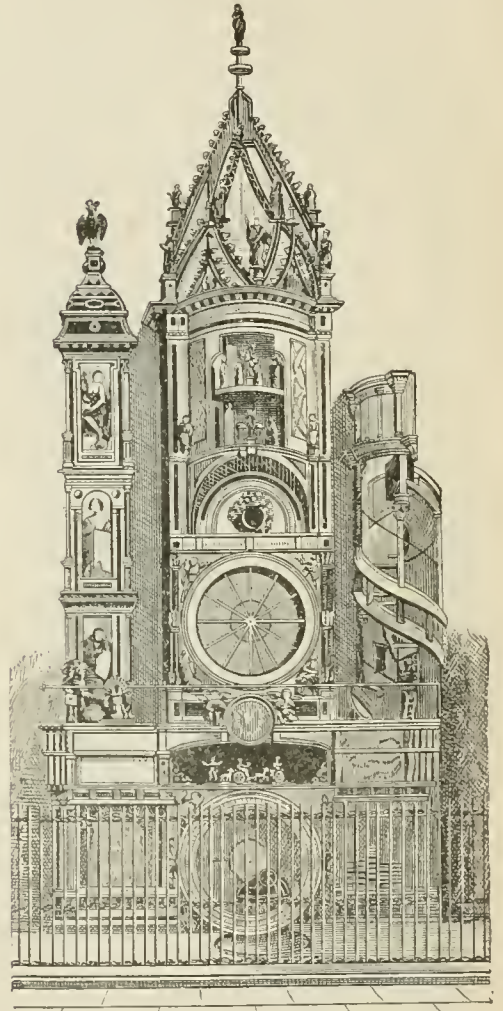


FIG. 5. STRASSBURG CATHEDRAL CLOCK.

portion of the clock is a celestial globe, indicating sidereal time, and showing the rising, passing over the meridian of Strassburg, and setting of all stars that appear above the horizon, visible to the naked eye. Behind the globe is a calendar, showing the day of the month and the fixed and movable feasts. A statue of Apollo points out the day of the month. The calendar is in the form of an annular band, so arranged as to show many other astronomical events besides the day of the month. Above the cal-

endar are figures drawn in chariots, one appearing each day. On Sunday Apollo appears, drawn by horses of the sun. On Monday Diana, emblem of the moon, drawn by stags, appears. She is succeeded in turn by Mars, Mercury, Jupiter, Venus, Cupid, and Saturn. Above these figures is the dial which tells the time of day. On each side of this dial sits a figure, one of which strikes the quarter-hours, and the other holds an hour-glass, and turns it every sixty minutes. The next story is devoted to a planetarium, and the next is a globe for showing the phases of the moon. Above this are movable figures, which in succession strike the quarter-hour. The first figure is an infant, which strikes the bell with a rattle; the second is a youth; the third an old man; the fourth is a figure of death, which strikes the bell with a bone. In the highest compartment is a figure of Christ. Each day at noon a procession of the Apostles passes before Him; while a cock, perched above, appears and flaps its wings and crows three times.

The clock at Beauvais, France, is almost as wonderful a piece of mechanism as the Strassburg clock. It is composed of 14 different movements, includes 90,000 different pieces, and weighs 35,000 pounds. There are about 50 dials for indicating different astronomical events. The clock is 36 feet high, 16 feet broad, and nearly 9 feet deep.

The clock in Lyons Cathedral is much like the Strassburg clock. The old clock of Prague was built by one Harausck; and so jealous were the citizens of Prague lest he should build a similar clock in some other city—so the story goes—that they put out his eyes. This clock also contains various mechanical figures. The hour is rung by a skeleton, with the bell-rope in his hands.

Another monumental clock is that in the clock-tower on the Piazza San Marco, Venice. A Madonna sits on a platform between two doors overlaid with gold. When the time for certain religious festivals occurs, an angel comes out from one of these doors, blows a trumpet, bows to the Virgin, and passes out at the other door. The hour is struck by two giants.

Belfry clocks with automatons began to wane in popularity during the seventeenth century, and very few have been constructed since. House-clocks with automatons were first made in the fifteenth century; but the height of their popularity was during the Renaissance, when wonderful skill and great artistic talent were expended in their construction. A favorite design for these clocks was that of a ship, whose crew performed numerous automatic functions. Perhaps the most beautiful as well as famous of these automatons is the ship-clock of Charles V. of France, now in the Cluny Museum. This clock was mounted upon rollers, on which its mechanism caused it to advance and recede. Another favorite design was a mounted huntsman, who, at the stroke of the hour, moved his head and arms, while the head and tail of the horse also moved. During the eighteenth century clocks with mechanically singing birds were popular. Within recent years automaton house-clocks have come to be regarded as interesting examples of mechanical ingenuity and skill, to be occasionally produced and admired, rather than as necessary or desirable articles of furniture.

The United States has produced its share of

automaton clocks, though most of them have been smaller than the great tower-clocks of Europe. The 'Rittenhouse clock,' made in 1767 by David Rittenhouse, of Philadelphia, has six dials, each marking off different astronomical events. The 'Columbus clock,' made by a citizen of Columbus, Ohio, is 18 feet wide and 11 feet high. Like the clocks already described, this one records many astronomical events; in addition, miniature figures perform various movements. Three towns of Pennsylvania—Donaldson, Hazleton, and Wilkesbarre—have possessed citizens who have added to their fame by their remarkable clocks.

In 1880 a clock was placed on exhibition in New York that was a striking illustration of the elaborateness to which clockwork may be carried. It was the work of Felix Meyer, who spent more than ten years in its construction. The clock is 18 feet high, 8 feet wide, and 5 feet deep. It has 2000 wheels, runs by 700-pound weights, and is wound up once in twelve days. When the clock is in operation, it shows the local time in hours, minutes, and seconds; the difference in time at Chicago, Washington, San Francisco, Melbourne, Pekin, Cairo, Constantinople, Saint Petersburg, Vienna, London, Berlin, and Paris; the day of the week, calendar day of the month, month and season of the year, the signs of the zodiac, revolutions of the earth on its own axis and around the sun; also the phases of the moon and the movement of the planets around the sun. The quarter-hour is struck by an infant, the half-hour by a youth, the three-quarter by an old man, and the hour by death, as in the Strassburg clock. As the hour strikes, a figure of Washington rises from a chair and extends its right hand, presenting the Declaration of Independence. A door is opened by a servant, and all the Presidents, as far as and including Hayes, each dressed in the costume of his time, advance across the platform, salute Washington, and retire through another door.

TOWER-CLOCKS. As already pointed out, the earliest European clocks were all tower-clocks—the house or 'chamber' clock being a later invention, closely connected with the invention of watches. Among the early clock-builders, ingenuity and complication of mechanism, as displayed in the automatons, was considered of more importance than accuracy as a timekeeper; but within recent years much scientific skill has been used to construct tower-clocks which, in spite of their enormous size and great height, with the accompanying atmospheric disturbances at so great a distance from the earth, shall still be accurate timekeepers.

One of the largest clocks in the world is the 'Westminster clock,' in the British House of Parliament, which was put in operation in 1860. Its four dials, situated 180 feet above the ground, are 22½ feet in diameter. Each minute-hand is 14 feet long, and the hour-figures on the clock are 2 feet long. The pendulum is 13½ feet long, and weighs 700 pounds. There are 5 bells, weighing respectively 21 cwt., 26 cwt., 33½ cwt., 78 cwt., and 13 tons 11 cwt., for striking the first, second, and third quarters and the hour. These bells are hung from massive wrought-iron framing, in a chamber above the dial. The largest, the hour-bell, popularly known as 'Big Ben,' is 9 feet in diameter, and is struck by a hammer

weighing 4 cwt., which is lifted 9 inches vertically from the bell before it falls. This bell and the great bell of Saint Paul's Cathedral are tolled on the death of members of the royal family of Great Britain. In the 'Westminster clock,' as in all the tower-clocks formerly constructed, the mechanism which drives the clock is located in the tower directly back of the face. But in the city-hall clock erected in Philadelphia in 1899 the clockwork is located in the main part of the building, and is connected with the dial-mechanism in the tower by means of compressed air. The whole is based on the fundamental principle of all modern mechanisms—the governing of great forces by comparatively feeble ones. The primary clock is an astronomical clock, constructed with the greatest care, so as to be free from all disturbances from dust, moisture, and vibrations, and is so constructed that without interfering with its delicacy and accuracy it can operate four sets of hands, each weighing 500 pounds. The dials are the largest in the world, having a diameter of 25 feet. The total height of the tower is 547½ feet, and the centres of the dials are 362 feet above the pavement. The hour-hand is 12 feet long, and is entirely different in shape from the minute-hand, so they never can be mistaken. The face of the dial is made up of several pieces, and the usual numerals are omitted from the face, not being of service at so great a height. The clock was designed by Warren S. Johnson; a detailed description of its mechanism was written by him, and published in the *Journal of the Franklin Institute* (Philadelphia) for February, 1901.

ELECTRIC CLOCKS. An electric clock is one whose mechanism is, in some way, either actuated or controlled by electricity. There are two types of electric clocks—(1) Independent clocks, whose mechanism is kept in operation by electricity; (2) systems of clocks which are connected with a central or primary clock by an electric circuit, and are so arranged that either (a) the primary clock regulates its movements, at stated intervals, by forcibly moving the hands by an electric current into the proper position, or (b) the primary clock directly runs the hands of the secondary clocks, which are simply dials without independent machinery.

Clocks of the first class usually have some electromagnetic attachment applied to the mechanism, which keeps them constantly wound up; in other words, they are constructed like ordinary clocks, except that they are self-winding. The first self-winding clocks were made as early as 1855 by Alexander Bain, who applied electromagnetic attachments to the bob of the pendulum, which, in obedience to contacts connected with the pendulum itself, attracted it to and fro. Since that time many other means of applying the electric current to keep a clock running have been devised, and hundreds of patents for the same have been taken out in England and America: but, as yet, this form of electric clock has proved of little practical value. Another form of independent electric clock was put in operation in 1896, in the laboratory of Durham College, North Carolina. The clock is run directly by electromagnets, which are actuated by a current from an earth battery. The pendulum is swung by the electric current, and it is this which moves the clock. The works

and dial are placed on the pendulum and swing with it.

In the second class of electric clock the object is to keep a system of clocks correct by an automatic connection with a central and standard timekeeper. It is probable that this method of time-service will be rapidly extended, until not only public buildings, but private offices are supplied with time from a central clock, as they now receive a common service in heat, light, power, water, etc. Instead of employing the central clock simply as a regulator, it may be adopted as an actual propeller of the clocks on its circuit, and the secondary clocks become mere dials for indicating time.

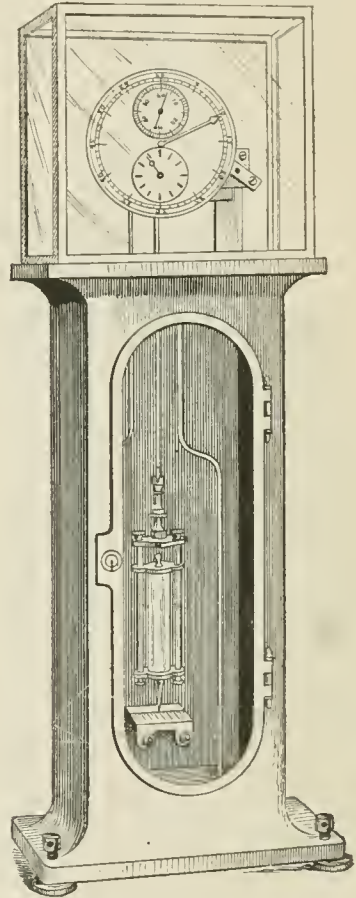


FIG. 6. ASTRONOMICAL CLOCK IN PHILADELPHIA CITY HALL.

Certain difficulties have been encountered in the electric connection between the main and secondary clocks, due, among other things, to induced currents from crossed telephone or other electric wires. In view of these difficulties, it has been proposed by prominent electricians that the Marconi wireless system be applied to clocks, and thus obviate the faults of the old system. Though the general adoption of electrically controlled clocks is a development of the close of the nineteenth century, they have long been the subject of experimentation. In 1837 Alexander Bain began to experiment on electrically driven synchronous clocks, and in

1846 his system was in use between Glasgow and Edinburgh.

PNEUMATIC CLOCKS. A system of synchronous clocks which are connected with the central controlling clock by compressed air instead of electricity is called pneumatic. The clockwork in the City Hall at Philadelphia, described above, is of this type. The movement of the central clock compresses air in the connecting tubes, and causes a bellows to expand at each dial, thus moving the hands.

ASTRONOMICAL CLOCKS. An astronomical clock is one built with the simplest and most accurate mechanism possible, and with every possible protection against outside disturbances, so that its movements will be sufficiently accurate for astronomical calculations. One of the most important considerations for an accurate timekeeper of this class is that it should be maintained at a constant temperature, and often in astronomical observatories, rooms are specially constructed for this particular purpose. It will be noticed, from the accompanying cut of the astronomical clock in the City Hall at Philadelphia, that the dial has three circles—the minute-circle above the centre, the twelve-hour circle beneath the centre, and the hour-circle upon the circumference of the dial. A clock regulated to keep sidereal time is sometimes called an astronomical clock, as is also a clock having a dial on which the movements of the heavenly bodies are shown.

CLOCKS AND WATCHES EXPORTED FROM THE UNITED STATES
(From the Statistical Abstract of the United States for 1900)

YEAR	Watches	Clocks	Total
1891.....	\$275,707	\$1,304,457	\$1,580,146
1892.....	208,743	1,020,873	1,229,616
1893.....	241,758	962,423	1,204,181
1894.....	383,279	919,534	1,302,813
1895.....	357,329	846,676	1,204,005
1896.....	530,980	929,395	1,460,375
1897.....	801,491	968,911	1,770,402
1898.....	771,912	955,557	1,727,469
1899.....	819,810	1,043,621	1,863,431
1900.....	787,620	1,190,074	1,977,694

CLOCK-MANUFACTURE IN THE UNITED STATES. American clocks were first manufactured in Connecticut, about 1800, by Eli Terry. His clocks soon became popular, and he continued in business until his death, when his sons succeeded him, under the name of the 'Terry Manufacturing Company.' Many neighboring establishments were soon engaged in clock-manufacture, and Connecticut is still the centre of the industry in the United States. According to the census of 1850, there were 1436 clock-factories and 2901 watch-factories in the United States. At first the movements were constructed of wood, and in the better clocks the pendulum was of wood overlaid with gold-leaf. In 1814 Terry invented the 'short-shelf clock,' which rapidly displaced the long or hanging clocks previously made. Brass-wheel clocks were not made in the United States until 1837. American manufacturers introduced the system of cutting out the parts from sheet brass with a die, instead of casting them—a method which at once insured greater accuracy as well as cheapness in the product. The adoption of the die and of other forms of automatic machinery in the manufacture of clocks has now been carried to such an extent that nothing is left for the skilled

hand-laborer but the collocation of the parts. Coiled springs, instead of pendulums, had been used in European clocks for two hundred years before their use was introduced into American factories; but they were placed only in the most expensive clocks: the invention of a reliable but cheap steel spring, which could be placed in the least expensive clocks, is due to American enterprise, and its introduction has revolutionized the clock-making industry. The small spring clocks can be manufactured and sold for less than one dollar, and are very popular.

BIBLIOGRAPHY. The following are general works on horology: Saunier, *Treatise on Modern Horology in Theory and Practice*, trans. from the French, by Julien Tuppiet and Edward Rigg (London, 1897); Kendall, *History of Watches and Other Timekeepers* (London, 1897); Grin-thorge, *Rudimentary Treatise on Clocks, Watches, and Bells* (London, 1883). In the *Journal of the Society of Arts* (London) for March 7, 1890, is an interesting article by Julien Tuplin, on "Recent Progress in British Watch and Clock Making." The Supplement of the *Scientific American* for September 19, 1896, contains an article translated from the French on "Clocks Provided with Automaton." The Philadelphia City-Hall Clock is described in the *Journal of the Franklin Institute* (Philadelphia) for February, 1901. *The Electrician* (London) for December 22, 1899, contains an article by F. Hope Jones, on "The Electric Time-Service." See WATCH; TIME-SIGNALS; TIME, STANDARDS.

CLOCK BELL-METAL. An alloy used for the making of bells in clocks, which may have the following composition: 72 parts copper, 26.56 parts tin, and 1.44 parts silver. The silver is added to give sweetness to the tone. In some cases, bismuth and antimony are added in small quantities; but while they are said to produce a better tone, they make the alloy more brittle.

CLODIA. The infamous sister of Clodius, and wife of Quintus Metellus Celer, whom she is supposed to have poisoned. She is identified with the Lesbia to whom Catullus addressed his love-poems. Her younger sister Clodia married Lucullus, but was put away on account of her conduct.

CLODIUS PULCHER, klō'dī-ŭs pul'kēr, PUBLIUS. A Roman demagogue. He appears in history, in B.C. 70, serving under Lucullus in Asia. In 69 he impeached Catiline for extortion in Africa; but Catiline bribed his accuser and escaped. Clodius appears to have been avaricious and unscrupulous. Near the close of the year 62 he was said to have had an intrigue with Pompeia, wife of Julius Cæsar, on the occasion of the celebration of the rites of the Bona Dea in Cæsar's house. Clodius was tried for violation of the sacred mysteries, but was acquitted, it was charged, because he had bribed the judge. He was elected tribune in 59, and one of his first acts was to exile Cicero, who had refused to defend him in the trial for sacrilege; but the great orator was soon afterwards recalled, in spite of Clodius's opposition. He went on from bad to worse, gathering around him the worst elements of the people, until he became a candidate for the pretorship (B.C. 53) in opposition to Milo. Both candidates worked with reckless energy.

The contest was ended in an unexpected manner, January 20, B.C. 52. Milo set out on a journey to Lanuvium. On the way he met Clodius, who was on his road to Rome. Both were accompanied by armed followers, but passed each other without disturbance. However, some of the men in the rear-guard of each party began to quarrel; a fight followed, and Clodius was killed. See *Milo*; and consult Cicero's oration, *Pro Milone*, which, however, is polemical and exaggerated.

CLODPATE, JUSTICE. A country justice in Shadwell's comedy *Epsom Wells*.

CLODT - JÜRGENSBURG, klôt-yur'gens-böörk. PETER KARLOVITCH, Baron (1805-67). A Russian sculptor, born at Reval. He studied at the artillery school of Saint Petersburg, and was for a short time in the army. He had his art training at the Academy of Saint Petersburg, where he was appointed a professor, and became particularly skillful in his depiction of horses, especially as seen in vigorous action. The horses executed for the quadriga group on the triumphal arch erected at Saint Petersburg in 1838 are excellent specimens of this feature of his work. The four colossal groups of "Horse-Tamers," in bronze, on the Anitchkov Bridge, Saint Petersburg, are also by him. Replcias of two of these are in the grounds of the Schloss in Berlin.

CLELIA, klê'li-ä. A maiden given by the Romans as a hostage to King Porsenna. She escaped from the Etrurian camp with some companions, swam the Tiber, and returned to Rome. The Romans, however, bent upon keeping good faith, sent the fugitives back to Porsenna, who, in admiration of this generous action, freed Clelia and her fellow-hostages, and allowed her to take with her some of the Etrurian youths. A statue was erected in her honor on the Via Sacra.

CLELIA GENS. A patrician clan of Rome, tracing its name to Clolius, one of the companions of Æneas. It was supposed to have been originally a noble Alban house. The name is also spelled Cluilia, and, in its ancient form, Cloulia.

CLOG ALMANAC. A form of rude calendar, said to be of Danish origin, and consisting of a square stick notched for months and days, and showing the saints' days, moon's phases, and other features of the almanac. Specimens are to be seen in the British Museum and other collections.

CLOISONNÉ, klwä'zô'nä'. See *ENAMEL*.

CLOISTER (from OF. *cloistre*, Fr. *cloître*, from ML. *claustrum*, inclosure, from *claudere*, to close). Strictly, the entire space inclosed by the main encircling wall of a religious establishment (Germ. *Kloster*, monastery), including church, dormitories, and all other buildings. Thus, all the buildings for the body of canons attached to a cathedral were included in the term 'cloister.' A 'cloistered monk' is one living within monastic precincts. But common usage has recently limited the term to those rectangular courts, in the centre of the main group of monastic or canonical buildings, which are surrounded on all sides by a covered arcade. These cloisters are the centre of monastic life; from their arcades the refectory, chapter-house, dormitories, and church are reached. In their central open space or *garth* are the well and garden. Cathedrals had their cloisters—usually attached to the north side of the church, the south side

being reserved for the episcopal palace. But in monasteries the main cloister was in the south flank. Many large monasteries had more than one cloister; one for the lay brothers, open to all (sometimes in front of the church); one for the monks; a third, smaller, for the abbot. In such great early Benedictine monasteries as Saint Gall there was a cloister for the artisans.

The earliest examples of rudimentary cloisters are in the monasteries of the fourth, fifth, and sixth centuries, in Syria; the earliest in the West have disappeared, none being earlier than the eleventh century. From that time until the fifteenth century Romanesque and Gothic cloisters abound everywhere. With the advent of the Renaissance and the decay of the orders in the fifteenth and sixteenth centuries, cloisters are rarer, except in Italy.

The general type of cloister is a colonnade resting on a high parapet, usually with a single opening in the middle of each side of the quadrangle leading into the central garden. In earlier cloisters the columns are single, heavy, and short, and the galleries are more ordinarily covered with a wooden roof than vaulted. Above these galleries rises a second story, either a second gallery or a solid construction (dormitory); in consequence of reconstructions, this upper story is very seldom preserved. During the twelfth century the single columns gave way to coupled shafts, slenderer and higher than those of the preceding style. Sometimes, especially in the North, piers supplemented or replaced columns. The cloister followed the changes of style of other buildings. The finest Romanesque cloisters are in southern France and Italy; Germany and England enter the field particularly during the Gothic period; Italy, with few exceptions, furnishes the only fine Renaissance examples. Saint Trophine in Arles is a rich, and Le Puy in Velay is a plain, example of French Romanesque cloisters, while those of Thoronet and Silvacane show the French Cistercian severity, and those of Fontfroide and Laon show transition to Gothic. In Italy at the same time there was far greater variety and richness. The northern examples at Verona (cathedral), Pomposa, and Bologna (San Stefano) are simple; but farther south the twelfth century developed richer types, as in the Oriental examples at Salerno, Ravello, and Amalfi, and the gem at Monreale (Palermo), with varied columns and mosaic decoration. These were soon to be followed by exquisite examples of the Roman school (Fossanova, Saint Paul, and the Lateran, Rome). In fact, Rome possesses an unrivaled series, from the heavy cloister of the Tre Fontane and San Lorenzo to the delicate cloister of Saint Paul, through all intermediate stages. Gothic cloisters were beautiful everywhere, but the finest specimens are those of the north of Europe, especially France. The arcades are surmounted by rich tracery, by which the galleries, now usually covered with lofty groin vaulting, are well lighted. In cooler climates the tracery, sometimes the entire gallery, was glazed. The cloisters of Noyon, Semur, Soissons—the last-named exquisitely rich—of Mont-Saint-Michel (with its novel tripod arrangement of shafts), of Rouen, with a beautiful second story, express the ideas of the Golden Age of the thirteenth century in France; while those of the fourteenth and fifteenth centuries are

poorer and inferior, as at Bordeaux and Narbonne. In Germany the most interesting are the Cistercian cloisters, like those of Maulbronn, Altenberg, and Heiligenkreuz. In England, though there are some good early Gothic examples—as at Salisbury—the best are late, as at Gloucester, Hereford, and Canterbury.

CLOISTER AND THE HEARTH, THE. An historical novel of the time of the early Renaissance, by Charles Reade (1861). The scene is laid chiefly in Holland and Italy. The book should be read and contrasted with George Eliot's *Romola*, which appeared almost simultaneously, and which in part deals with a like theme.

CLONMEL' (Ir., honey-meadow). A municipal borough in Tipperary and Waterford counties, Ireland, on both banks of the Suir, 14 miles south-southeast of Cashel (Map: Ireland, D 4). It stands chiefly on the Tipperary side of the Suir, and on one of the isles of the river. Among its industries are flour-milling, brewing, and tanning. The chief exports are agricultural produce and cattle. Barges of 20 to 50 tons ply on the Suir to Waterford. Clonmel was an important place in Danish times. In the thirteenth century the Franciscans established universities in the town. In 1650 Cromwell besieged the town and demolished the castle. Clonmel was the birthplace of Laurence Sterne, the novelist. Clonmel is still a great tourist resort, but there has been a gradual decrease in its population. In 1871 it numbered about 10,000; in 1900, about 8000.

CLONTARF' (Ir., bull's meadow). A town of Ireland, about three miles east-northeast of Dublin (Map: Ireland, E 3). It is much frequented during the summer months for sea-bathing, and there are many handsome villas in the vicinity. Clontarf is celebrated as the place where, in 1014, Brian Boróimhe (q.v.) met his death while winning a great victory over the Danes. Population, in 1900, about 5000.

CLOOTS, klōts, or **KLOOTZ**, JEAN BAPTISTE DU VAL-DE-GRÂCE, Baron (1755-94). A free-thinking philosopher and republican enthusiast of the French Revolution, generally referred to as 'Anacharsis Cloots, the Orator of the Human Race.' He was born June 24, 1755, at Gnadenthal, near Cleves, the son of a German baron of Dutch extraction, and was sent to Paris to be educated when he was only eleven years of age. There he seems to have imbibed extremely rationalistic ideas on religion and politics, which were strengthened by a short residence in Berlin, where he came in contact with the Potsdam philosophers, one of whom was his uncle, Cornelius de Pauw. Returning to France at the age of twenty-one, Cloots began the campaign of Reason by an attack on revealed religion, and published a curious book, entitled *Certitude des preuves du Mahométisme*—a satirical work, which fell somewhat flat. A visit to England, where he became intimate with Burke, was followed by an extended tour on the Continent, which his income of 10,000 livres a year allowed him to make in ease and comfort. Everywhere he took occasion to preach his doctrines of liberty, equality, and fraternity, and in several countries he barely escaped imprisonment. From Portugal the news of the outbreak of the French Revolution sent him post-haste to Paris, where he at once began to play an im-

portant part. He was instrumental in spreading republican principles in Brittany, and on June 19, 1790, he appeared at the bar of the National Assembly at the head of a throng of Parisians from the slums dressed up in fantastic costume to represent the nations of the earth, and delivered a magniloquent oration in behalf of 'Universal Republicanism.' To show the sincerity of his principles, he discarded his rank and titles (though not his income) and stood forth before the world as 'Anacharsis Cloots, Orator of the Human Race, Representative of the Oppressed Sovereign Peoples of Mankind.' Cloots was made a French citizen, and in 1792 was elected to the National Convention. He urged a war of republican propaganda against Europe, and voted for the death of the King, 'in the name of the human race.' He was popular with the visionaries and with the lower orders of Paris, but incurred the enmity and suspicion of Robespierre. In consequence, Cloots was expelled first from the Jacobin Club, and subsequently from the Convention. He was finally arrested in 1794, and after a summary trial was sent to the guillotine, together with Hébert and his followers, March 24, 1794. He left a number of pseudo-philosophical and political works, the chief of which are *L'orateur du genre humain* (1791) and *Base constitutionnelle de la république du genre humain* (1793). For his life, consult: Avenel, *Anacharsis Cloots, l'orateur du genre humain* (Paris, 1865); Gallois, *Histoire des journaux et des journalistes de la révolution française*, vol. ii.; Bax, *Outlines from a New Standpoint* (London, 1891).

CLORIDANO, klō'rê-dî'nò. A young Moor, in Ariosto's *Orlando Furioso*, the friend of Medoro, with whom he seeks the body of King Dardinello on the battlefield.

CLORIN'DA. (1) In Tasso's *Jerusalem Delivered*, a leader of the forces opposing the Crusaders at the siege of Jerusalem. Tancréd falls in love with her, but accidentally kills her in a combat at night, and administers Christian baptism to her before her death. (2) In Fletcher's *Faithful Shepherdess*, a beautiful character on which Milton drew in *Comus*.

CLO'RIS. A maiden in love with Prince Prettyman, in Buckingham's *The Rehearsal*, who commits suicide when he weds old Joan.

CLOSE (from OF. *clos*, p.p. of *clorre*, to shut, from Lat. *claudere*, to close). A term in heraldry. When the wings of a bird are down and close to the body, it is described as close. The word is used only with reference to birds addicted to flight. See HERALDRY.

CLOSE. A space inclosed by a wall or fence; a court, yard, or quadrangle; a narrow side-street or passage leading to a court; especially the precincts of a cathedral or a monastery.

In a legal sense, it is a parcel of land in which some one has an interest, amounting at least to a right to present possession, and which in fiction of law is considered as inclosed by an ideal or invisible, if not real, boundary. Breaking or entering another's close is a trespass. The term is not in general use in the United States. See CURTILAGE; FEE; TRESPASS.

CLOSE POLLINATION. See POLLINATION.

CLOSE (klōs) **TIME**. A portion of the year during which game or fish may not be killed or caught. See GAME-LAWS.

CLOSET, klô-zê' (OF. *closet*, dim. of *clos*, close). In heraldry (q.v.), the half of the bar.

CLOSTER-SEVEN (KLOSTER-ZEVEN). See WILLIAM AUGUSTUS, Duke of Cumberland.

CLOSURE, or **CLÔTURE**, klô'tur' (OF. *clôture*, Fr. *clôture*, from Lat. *clausura*, a closing, from *claudere*, to close). A rule of procedure adopted in the English Parliament, for the purpose of terminating prolonged discussion, and bringing matters under debate to an issue. It had its origin in 1882, when the policy of obstruction adopted by the Irish members made legislation impossible. It was decided then that, at the request of 40 members, the Speaker might declare debate closed, and call for a vote on the question under discussion. As modified in 1887 the rule now stands that the Speaker may cut off discussion at the request of 200 members, or at the request of 100 only, if less than 40 members vote in the negative. In France the *clôture* has also been frequently used, since the *coup d'état* of 1851. In the United States House of Representatives, and in the State Legislatures, the same object is attained by moving the 'previous question.'

CLOT, klô, ANTOINE BARTHÉLEMY, or **CLOT BEY** (1793-1868). A French physician, born at Grenoble. He studied at Montpellier, and for several years practiced medicine and surgery at Marseilles. After 1822 he lived mostly in Egypt, where by order of Mehemet Ali he established hospitals and medical and pharmaceutical colleges and organized the medical service of the Army and Navy. In 1832 he was given the rank of an Egyptian bey, and in 1836 that of a general. After the death of Mehemet Ali, Clot left Egypt and resumed the practice of medicine at Marseilles. In 1854 he returned to Egypt, and became physician-in-ordinary to the Viceroy, Saïd Pasha. Clot's great activity as an organizer did not prevent him from carrying out important scientific observations and gathering large scientific collections. His published works include: *Relation des épidémies de choléra-morbus qui ont régné à l'Égypte, à Suez et en Egypte* (1832); *De la peste observée en Egypte* (1840); *Coup d'œil sur la peste et les quarantaines* (1851); *Mehemet-Ali, Vice-roi d'Égypte* (1862); *De Pophthalmie, du trichiasis, de l'entropion et de la cataracte observés en Egypte* (1864); and *Un dernier mot sur la non-contagion de la peste* (1866).

CLOTAIRE, klô'târ', I. and II. See MEROVINGIANS.

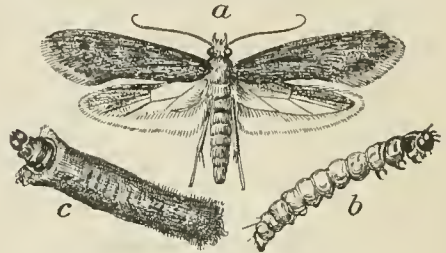
CLOBUR. See COCKLEBUR.

CLOTEN. The stepson of Cymbeline, in Shakespeare's *Cymbeline*—a malicious character.

CLOTH. See WOOLEN AND WORSTED MANUFACTURES; WEAVING.

CLOTHES - MOTH. Any of several small moths of the genus *Tinea*, the larvæ of which feed on woolen fabrics and furs. In the United States the depredations wrought by clothes-moths, or 'moth,' are caused by at least three different species, which differ both in structure and habits. One (*Tinea pellionella*) is a small brown moth, with darker brown spots on the fore wings, whose larvæ live within a case composed of bits of the food-material bound together with silk. As the larvæ increase in size, the

silk cases are lengthened, and when the case becomes too narrow it is split open and a new part is inserted, as may be demonstrated by changing the caterpillar from time to time to differently colored materials. The larva of another, the carpet-moth (*Tinea tapetzella*), lives within a winding gallery made up of bits of carpet or other cloth held together with silk. Its fore wings are blackish and yellowish white; the hind wings and head are dark gray. The straw-colored species (*Tinea biselliella*) has a naked larva that spins a little silk over its food-material, but makes neither a case nor a gal-



CLOTHES-MOTH.

a, The moth; b, feeding larva; c, pupa in case.

lery. When ready to pupate a cocoon is spun, which, like the larval cases of the foregoing, is composed of fragments of cloth bound together by silk. In the spring or early summer woolen clothes and furs should be thoroughly brushed and subjected to direct sunlight. They should then be carefully packed away in cloth bags or tight boxes, together with naphtha-balls or tobacco-leaves. Tared paper and plenty of newspapers are useful for wrapping up rugs. Bits of camphor-wood or cedar are also helpful in keeping out moths. A few drops of carbon bisulphide allowed to evaporate in a tight compartment containing infested goods will kill moths and eggs; but as it is very inflammable and the fumes are injurious to man, it should be used with caution. Benzine and gasoline are also useful but rather dangerous moth-killers, and printer's ink is poisonous. The best preventive for rugs, etc., is constant use and 'kicking about,' for small garments and furs, inclosure in tight cloth bags. Consult Marlatt, *Household Insects of the United States* (Department of Agriculture, Washington, 1896).

CLOTHO (Lat. from Gk. Κλωθώ, *Klôthô*, the Spinster, from κλώθειν, *klôthein*, to spin). One of the three Fates. See PARCE.

CLOTILDA, SAINT (c.475-545). A daughter of Chilperic, King of Burgundy, and wife of Clovis, King of the Franks. Her father and mother were murdered by her uncle, Gundebald, who spared the child and educated her. She was married to Clovis (q.v.), who through her influence was converted to Athanasian Christianity in 496. He avenged the murder of her family by reducing Gundebald to subjection. After the death of Clovis Clotilda persuaded her sons to renew the quarrel, and a war followed that ended in the union of Burgundy with the Frankish kingdom. Clotilda retired to Tours, and practiced the austerities of a devotee until her death. She was buried in the Basilica of Saint Peter, which she had built in Paris, and was canonized by Pope Pelagius. There is a statue

of her in the Luxembourg, and a fine church in her honor was built in Paris between 1846 and 1856.

CLOUD, THE. One of Percy Bysshe Shelley's best-known poems (1820).

CLOUD, CLOUDINESS (AS. *clūd*, mass of rock, hillock, which a cloud often resembles). In general, anything that obscures the vision through a clear atmosphere, as clouds of dust, smoke, or moisture. The clouds of smoke over cities and from forest fires and the clouds of dust over the plains of India have an important temporary influence on local climate. In meteorology, the terms denote the moisture of the atmosphere precipitated from an invisible state of vapor into minute globular particles that float for a long time in the air. These particles are so small that they cannot descend rapidly through the ordinary atmosphere, even when perfectly still, on account of its viscous resistance or so-called internal fluid-friction. The gentlest ascending current or the slight vertical component of a nearly horizontal current suffices to keep the cloudy particles from falling to the ground.

The condensation of the invisible moisture of the air into particles of water cannot be accomplished in the free atmosphere without a decided reduction of temperature; and this may occur in three ways: (1) If air comes in contact with a cold solid, the latter may be covered with dew; but if two masses of warm-moist and cold-moist air come together, a slight condensation and haze or cloud may be formed where they mix with each other. These clouds by mixture have been extensively studied by Brilouin. (2) If moist air is cooled by radiation of heat, the coolest portions will soon fall to the temperature of the dew-point, and the vapor therein begin to become visible as a fog; these foggy particles radiate rapidly, thereby increasing the coolness of the air and stimulating the formation of more fog. (3) But the principal method by which cooling is effected in order to form cloud is the process called dynamic cooling, first expounded by Espy, Kelvin, Reye, and Peslin, and developed in detail by Bezold and Bigelow. Air expands when it is brought under lower barometric pressure; it may be by being pushed up over a mountain, or it may be by rising up because of its own buoyancy. In either case, the expansion takes place against the adjacent air, and presses the latter to one side. This operation constitutes work done on the resisting air, and work involves the action of some force

which, in the present case, is almost invariably the expansive force due to the heat that is latent in the atmosphere—viz. in the air and vapor combined, or the so-called thermal content.

The work done in expansion is said to be done at the expense of the internal heat of the air; or, heat is abstracted from the expanding air in order to do work on the air that is being pushed aside. Consequently, the expanding air grows cool in proportion to the work done. When it is thereby cooled to the dew-point, the vapor begins to condense upon dust particles as solid nuclei and forms liquid drops; this involves the giving up of a large amount of heat known as the latent heat of vaporization, which has to be lost by radiation from the drop, wherefore the cooling of the mass becomes much slower. In this process of condensation, a given amount of cooling requires a much larger amount of expansion, and therefore of work done, than in the previous stage before cloudy condensation began. This stage is illustrated in the formation of the cumulus clouds seen with showers or thunder storms or especially in hail weather. On these occasions, the cumulus clouds grow rapidly upward to great heights. The upper parts of these clouds can be at such a low temperature as to contain snow or hail in place of water particles. The forms and the quantities of clouds, the direction and velocity of their movements, the apparent changes they undergo, and many other peculiarities have for a century past formed an item of increasing importance in the study of meteorology.

The first step toward simplifying and harmonizing the old meteorological records was taken by Luke Howard, in 1802, in his proposed classification of clouds into three primary forms (*cirrus*, *cumulus*, *stratus*), and three intermediate forms (*cirrocumulus*, *cirrostratus*, and *cumulostratus*), and these have been almost universally adopted by modern observers; but experience has shown that they do not give a sufficient range of terms to enable one easily to classify and describe all the varieties of clouds that are to be observed. Probably no simple system of nomenclature would suffice to do this, and Cleveland Abbe has proposed for special students a system of symbols based on the methods of formation of the various kinds of clouds. The many other modifications and new terms that have been suggested are well compared and discussed in a memoir by Mr. H. H. Clayton, of the Blue Hill Meteorological Observatory, near Boston, Mass.

MEAN HEIGHTS AND VELOCITIES OF CLOUDS AT WASHINGTON, D.C., APRIL, 1896, TO MARCH, 1897.

NAMES	MEAN HEIGHTS		MEAN VELOCITIES		EXTREME HEIGHTS	
	April to September	October to March	April to September	October to March	Maximum	Minimum
	Meters	Meters	M. P. S.	M. P. S.	Meters	Meters
Cirrus.....	10,358	9,511	30.3	34.9	17,182	5,354
Cirro-stratus.....	10,620	9,526	26.9	30.4	16,144	5,142
Cirro-cumulus.....	8,826	7,413	23.4	33.4	15,411	3,067
Alto-stratus.....	5,772	4,801	17.6	21.3	15,552	1,613
Alto-cumulus.....	5,030	3,822	16.5	21.1	10,167	1,524
Strato-cumulus.....	2,870	2,399	10.5	15.1	7,285	1,375
Nimbus.....	1,926	1,804	8.5	11.9	4,022	634
Cumulus, dome.....	3,068	2,855	.....	.....	.....	.....
“ top.....	1,819	1,694	7.0	10.9	5,242	545
“ base.....	1,182	1,198	.....	.....	.....	.....
Cumulo-nimbus, top.....	4,965	3,730	15.3	21.1	15,903	1,249
“ “ base.....	1,750	.....	.....	.....	.....	.....
Stratus.....	838	1,132	6.0	10.5	.....	.....

The descriptive abbreviations and classification introduced by the International Meteorological Congress, held at Munich in 1891, is that which is now adopted more or less completely by all the national weather bureaus. Systematic observations upon the heights and movements of all clouds were made at many stations throughout the world in concert from May 1, 1896, to July 1, 1897. From these observations a general idea of the heights of the respective kinds of clouds may be gathered, as shown in the preceding list, compiled from Professor Bigelow's *Report on International Cloudwork of the United States Weather Bureau*, page 20. The titles and descriptions of the clouds are as used by the International Committee.

CIRRUS (Ci.). Isolated feathery clouds of fine fibrous texture, generally brilliant white, frequently arranged in bands which spread like the meridians on a celestial globe over a part of the sky, and converge in perspective toward one or two opposite points of the horizon. (In the formation of such bands, cirro-stratus and cirro-cumulus often take part.)

CIRRO-STRATUS (Ci. S.). Fine whitish veil, sometimes quite diffuse, giving a whitish appearance to the sky, and called by many 'cirrus haze,' and sometimes of more or less distinct structure, exhibiting tangled fibres. The veil often produces halos around the sun and moon when seen through it.

CIRRO-CUMULUS (Ci. Cu.). Fleecy cloud. Small white balls and wisps, without shadows, or with very faint shadows, which are arranged in groups and often in rows.

ALTO-CUMULUS (A. Cu.). Dense fleecy cloud. Larger whitish or grayish balls, with shaded portions, grouped in flocks or rows, frequently so close together that their edges meet. The different balls are generally larger and more compact (passing into strato-cumulus) toward the centre of the group, and more delicate and wispy (passing into cirro-cumulus) on its edges. They are very frequently arranged in lines in one or two directions.

ALTO-STRATUS (A. S.). Thick veil of a gray or bluish color, exhibiting in the vicinity of the sun and moon a brighter portion, which, without causing halos, may produce coronæ. This form shows gradual transitions to cirro-stratus; but, according to the measurements made at Upsala, was of only half the altitude.

STRATO-CUMULUS (S. Cu.). Large balls or rolls of dark cloud, which frequently cover the whole sky, especially in winter, and give it at times an undulated appearance. The stratum of strato-cumulus is usually not very thick, and blue sky often appears in the breaks through it. Between this form and the alto-cumulus all possible gradations are found. It is distinguished from nimbus by the ball-like or rolled form, and because it does not tend to bring rain.

NIMBUS (N.). Rain-clouds. Dense masses of dark, formless clouds, with ragged edges, from which generally continuous rain or snow is falling. Through the breaks in these clouds there is almost always seen a higher sheet of cirro-stratus or alto-stratus. If the mass of nimbus is torn up into small patches, or if low fragments of cloud are floating much below a great nimbus, they may be called *fracto-nimbus* (the 'scud' of the sailors).

CUMULUS (Cu.). Woolpack clouds. Thick clouds, whose summits are domes with protuberances, but whose bases are flat. These clouds appear to form in a diurnal ascensional movement, which is almost always apparent. When the cloud is opposite the sun, the surfaces which are usually seen by the observer are more brilliant than the edges of the protuberances. When the illumination comes from the side, this cloud shows a strong actual shadow; on the sunny side of the sky, however, it appears dark, with bright edges. The true cumulus shows a sharp border above and below. If often torn by strong winds, the detached parts (*fracto-cumulus*) present continual changes.

CUMULO-NIMBUS (Cu. N.). Thunder-cloud; shower-cloud. Heavy masses of clouds, rising like mountains, towers, or anvils, generally surrounded at the top by a veil or screen of fibrous texture ('false cirrus'), and below by nimbus-like masses of cloud. From their base generally fall local showers of rain or snow, and sometimes hail or sleet. The upper edges are either of compact, cumulus-like outline, and form massive summits, surrounded by delicate false cirrus, or the edges themselves are drawn out into cirrus-like filaments. This last form is most common in 'spring showers.' The front of thunder-storm clouds of wide extent sometimes shows a great arch stretching across a portion of the sky, which is uniformly lighter in color.

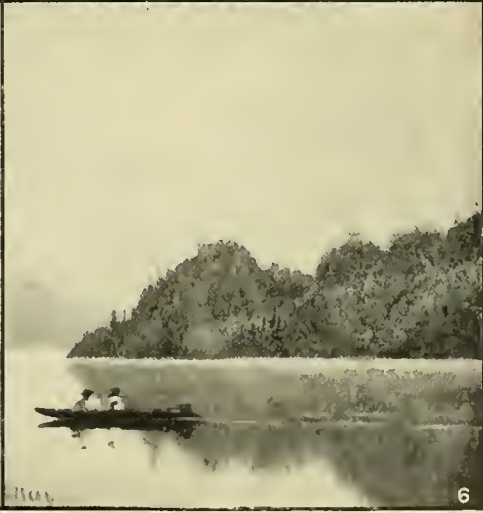
STRATUS (S.). 'Lifted fog' in a horizontal stratum. When this stratum is torn by the wind or by mountain summits into irregular fragments, they may be called *fracto-stratus*.

In general, the cirrus, cirro-stratus, and cirro-cumulus are the highest and swiftest; the alto-stratus, alto-cumulus, strato-cumulus, and cumulo-nimbus are median; the nimbus, cumulus, and stratus are lowest and slowest. These three groups are also generally distinctive as to their appearances and methods of formation.

There are some rarer forms of clouds that have received special or local names, such as the following: *Phosphorescent*, sometimes called iridescent, opalescent, or luminous night clouds. These are seen even at midnight in Europe as distant, pure white clouds, near the horizon. Measurements appear to show that they are from 10 to 20 miles above sea-level; they may possibly be self-luminous or phosphorescent, but it is more likely that they shine by reflecting the light from a distant twilight. *Hoods*, or false cirri, enveloping a mountain-top, or the summit of a cumulus dome. These are formed in the air that is pushing upward over the obstructing mountain. The *tablecloth* of Table Mountain at Cape Town is formed somewhat like the hood, but covers the whole flat top of the mountain and hangs down a little way over the leeward cliffs with frayed edges as the cloud-matter evaporates back into invisible moisture.

The *helm-cloud* and *helm-bar* are stationary clouds, formed at the summits of standing waves of air. When an east wind blows over the Crossfell Range, in Cumberland, England, there is formed not merely a cloud or hood or helmet with rain at the summit of the range, but a series of undulations to the leeward, one or more of which may rise high enough as a standing wave to form a cloud at its summit; through this cloud, in fact, the wind is blowing, and the cloud-particles formed on the windward side are

TYPICAL CLOUD FORMS



1. CIRRUS.
2. CIRRO-CUMULUS.
3. STRATO-CUMULUS.

4. NIMBUS.
5. CUMULUS.
6. STRATUS.

carried up through the cloud and down again on the leeward side, evaporating and disappearing as they descend at about the same level as when they were formed on the windward side. *Tornado cloud* and *waterspout cloud* are the distinctive, cloud-like form that reaches down nearly to the surface of the earth or ocean from the main cloud-mass above, and marks the central axis of a whirling mass of air. Within such a whirl, the barometric pressure is reduced by reason of centrifugal force, and any air that is drawn inward expands, cools, and forms cloud, just as it would do if it rose upward into regions of lower pressure. When the whirl ceases, the cloud immediately disappears. *Globo-cirrus*, a cirrus cloud having a globular form, from which stream downward fibres or filaments, as though the particles of the globular mass were being pulled out by the wind, or were settling down by their own weight into air-currents of a different velocity horizontal. *Mammato-cumulus*, protuberances or pockets on the under side of an otherwise flat-bottomed cloud, as though the heavier portions of the cloud were settling down in groups from the main cloud. This formation may also sometimes represent the central portions of adjacent whirls of air rising up into the clouds; but this latter phenomenon, which has been seen by Abbe, is probably not so frequent as the former.

The study of the movements of the clouds is our principal source of information relative to the general motion of the air at considerable heights above the sea or land. During the past fifty years an increasing amount of attention has been given to this matter, and the use of the nephoscope and photogram-meter has greatly increased the accuracy of observation. By international agreement, special observations were made in many countries in 1896 and 1897, the results of which were published during the years 1898-1901; of these reports the most important is that by Prof. F. H. Bigelow, published in the *Annual Report of Prof. Willis L. Moore*, chief of the United States Weather Bureau.

The average area covered by clouds, taking the globe as a whole, is about one-half of its surface. They, therefore, play a very important part in the distribution of solar heat over the earth's surface and within the atmosphere, and the consideration of this influence alone is a very important but difficult problem in the determination of the motions of the atmosphere. See DEW; EVAPORATION; NEPHOSCOPE; RAIN; SNOW.

CLOUDBERRY (ME. *cloud*, mass of rock, hill, AS. *clūd*, round mass, mass of rock + *berry*) (*Rubus chamaemorus*). A plant of the same genus with the dewberry, which it resembles. It has a trailing habit of growth, and never attains a height of more than 8 to 10 inches; the leaves, few, large, lobed, and somewhat kidney-shaped; the flower large and white, male and female flowers on separate plants, the female plant producing an orange-red fruit equal in size to a dewberry, and of an agreeable flavor. It is a native of the northern parts of Europe, Asia, and America. In Great Britain it is chiefly confined to elevated moors; in Norway and Sweden it is much more abundant, and the fruit is highly valued and made into excellent preserves. In America it is found only sparingly south of the Canadian boundary, but it is common and greatly prized in Newfoundland,

Labrador, Nova Scotia, and northern Quebec. It is abundant through northern Canada, extending from the Atlantic to the Pacific and north to the Arctic Circle. Unfortunately, the plant is of difficult cultivation, and no attempt to make it produce fruit freely in our gardens has yet been successful. Somewhat similar to the cloudberry is *Rubus geoides*, which yields a very agreeable fruit, as large as a raspberry, one of the few native fruits of Tierra del Fuego and the Falkland Islands.

CLOUDBURST. A term first applied in the United States about 1840, and in India about 1860, to a sudden extraordinarily heavy local rain. No definite rate or amount of rainfall, or area covered by it, has been assigned as a limit proper for distinguishing cloudbursts from ordinary heavy rains. Many special cases of cloudbursts have been described in English and American meteorological journals, especially in the *United States Monthly Weather Review*, from which it may be seen that the term is rarely used unless six or more inches of rain fall, and at the rate of 10 or more inches per hour. Thus, in one case, 10 inches fell in an hour; in another, the extreme case, 21 inches. Nothing definite is known as to the areas covered by these heavy rains; but it is not likely that the heaviest cover more than an acre, or that the lighter ones cover more than a square mile. Several cloudbursts have occurred on the eastern slope of the Rocky Mountains; but the great rains that cause the heavy floods along the eastern slope of the Appalachians from Georgia to Pennsylvania sometimes attain the intense local character that is ordinarily attached to the term cloudburst. Professor Ferrel has explained how a mass of water can be held within the cloud by means of rapidly ascending currents; but there is scant evidence of the actual existence of the strong ascending wind required by this explanation, and it seems equally possible that cloudbursts may result from the sudden formation of a large mass of rain in a very tall cloud, rather than from the gradual accumulation of rain in the clouds. Consult: Ferrel, *Recent Advances* (Washington, 1885), and his *Popular Treatise on the Winds* (New York, 1893).

CLOUD ON TITLE. An apparent defect in the title to real estate, based on a written instrument, judgment, or order of court, which purports to create an interest or lien in or an incumbrance upon the land in question. The person whose land is so affected may have the 'cloud' removed by appropriate proceeding in equity, instituted by a bill in the nature of a bill to quiet possession, known specifically as a 'bill to remove cloud on title.' The judgment of the court may direct the obnoxious instrument to be delivered up and canceled, or the record of such incumbrance or lien canceled, or may by decree declare a judgment, order of court, or proceedings under an invalid tax-levy, to be void and of no effect so far as the land in question is concerned.

In order to obtain this remedy, however, the instrument or act purporting to create the cloud on title must have apparent validity. A deed or mortgage void upon its face does not create a cloud, and cannot be attacked by such a proceeding. See BILL IN EQUITY; INCUMBRANCE;

TITLE; and consult the authorities referred to under the last-mentioned reference.

CLOUDS, THE. The most famous of the comedies of Aristophanes, produced in B.C. 423, when it took the third prize. It is a satire on the Sophists, and unjustly attacks Socrates as their representative.

CLOUDY BAY. An inlet of Cook Strait, to the northeast of South Island, New Zealand. Cloudy Harbor, on its north shore, is well known (Map: East India Islands, L 7). The south shore is bold and lofty. The rivers Awatere and Wairau flow into the bay.

CLOUET, klou'ā'. A French family of painters, originally Flemish. JEHAN, the first Clouet, lived in Brussels about 1475, and does not seem to have left his country. His son, JEHAN, called JEHANNET (c.1485-1541), came to France, and settled at Tours, where he married Jeanne Boucault. Afterwards he went to Paris, where, about 1518, he became Court painter and valet-de-chambre to Francis I. Two portraits of the King are attributed to him—one representing him as a young man, in the Louvre, and the other representing him as a middle-aged man, in the Pitti Palace, Florence. This latter was also supposed to be by Holbein, and may possibly be by François, Jehannet's son. Both works have the hall-mark of the Flemish School—a certain dryness and elaboration of detail and great delicacy of treatment.—FRANÇOIS, also called JEHAN or JEHANNET (c.1510-72), was probably born at Tours. He succeeded his father as Court painter and valet-de-chambre to Francis I., and afterwards held the same position under Henry II., Francis II., Charles IX., and Henry III. There are several allusions to him in the Court documents of the time, and we learn from them that he molded the wax funeral effigies of Francis I. and Henry II. Despite the influence of the Italian artists, whom Francis and his successors patronized, Jehan was considered the first painter of his day. The poets Ronsard and Du Bellay both speak of his portraits. Many of his works have been mistaken for those of Holbein, and only two of his portraits, those of Charles IX. and Elizabeth of Austria, have been positively identified as his. He preserves the Flemish realistic method and love of detail, carried to an extreme, in his treatment of such accessories as jewels and lace, along with precision and delicacy in flesh-painting. Other pictures probably by him are portraits of Francis II. as a child, in the Antwerp Museum, and of the Duke of Anjou, Berlin Museum, and a portrait called Sir Thomas More, in the Brussels Museum. His subjects are usually small full-lengths, with a background of greenish blue. A large number of drawings are also attributed to him. Many portraits in the style of Clouet were produced by copyists and imitators. There is supposed to have been still another Clouet, a brother of François; but of him nothing is known. Consult: Laborde, *La renaissance des arts à la cour de France* (Paris, 1855); Woltmann and Woermann, *Geschichte der Malerei*, ii. (Leipzig, 1879-82); Pattison, *The Renaissance of Art in France* (London, 1879); Gower, *Three Hundred Portraits by Clouet at Castle Howard* (London, 1875).

CLOUGH, kluf. ARTHUR HUGH (1819-61). An English author. He was born in Liverpool, but when only four years old was taken by his

father, a merchant, to Charleston, S. C. He returned to England, however, in 1828, and was at Rugby under Doctor Arnold, whose strenuous appeal to moral responsibility in boys probably had an unhappy effect upon Clough's temperament, naturally high-strung, with a tendency to more or less morbid introspection. His Oxford career had an even more decisive influence on his life. He entered the university at the height of the 'Tractarian Movement,' with one of whose most brilliant men, William George Ward, he was intimate. For a time he was carried away by the new current, but the reaction took him further in the opposite direction. He held a fellowship at Oriel College from 1843 to 1848, but relinquished it when it became clear to him that he could no longer subscribe to the religious doctrines involved—becoming later an examiner under the Education Department, like Matthew Arnold, with whom he had much in common. His temperament was essentially skeptical—in no mere negative sense, but in that of reverent and anxious seeking for the truth at all costs. It is this characteristic which dominates the whole of his literary work, whether verse or prose. In his three longer poems, *Dipsycheus*, *The Bothie of Tober-na-Vuolich*, and *Amours de royage*, the analysis of character disturbed by spiritual conflict is the main interest; though he shows a perfect consciousness that the habit of self-analysis and suspense of judgment may be carried too far. After his death, which occurred on a tour in Italy, he was commemorated in one of the noblest elegies in the English language—Arnold's *Thyrsis*; and Lowell (whom, with Emerson, Longfellow, and other eminent men, he had met on a visit to America) expressed the feeling that he would "be thought a hundred years hence to have been the truest expression in verse of the moral and intellectual tendencies, the doubt and struggle toward settled convictions, of the age in which he lived." His *Poems and Prose Remains*, with letters and a memoir by F. T. Palgrave, were published the year after his death.

CLOUGH-LEIGHTER, kluf'-lā'tēr, HENRY (1874—). An American organist and composer. He was born in Washington, and was educated at Columbia University (1887-89) and at Trinity University, Toronto, Canada. So rapid was his progress, that at the age of fifteen he received an appointment as organist at Saint Michael and All Angels' Church, Washington, and in 1892 he became organist at the Church of the Epiphany and the Jewish synagogue in that city. In 1899 he removed to Providence, where he was for one year organist of Grace Church. He was professor of musical ethics and theory at the Howe School of Music, Boston, Mass., in 1902. He has written several excellent compositions, among which are the following: *Festival Service in D Major* (1896); *Te Deum Laudamus, G Major* (1898); *Ave Vinum* (1901); *Wassail* (1901); *Like a Rose Should Be* (1901).

CLOUS, JOHN WALTER (1837—). A German-American soldier, born and educated in Germany. He came to the United States in 1855, enlisted in the United States Army in 1857, and served until 1862, when he was appointed second lieutenant of the Sixth Infantry. He fought in the Civil War, and greatly distinguished himself at Gettysburg, for which conduct he received the brevet of first lieutenant and captain. He was

made a captain in the Thirty-eighth Infantry in 1867, and from 1868 to 1888 was engaged in frontier service, and became conspicuous for his bravery and skill in engagements with the Indians. In 1886 he became major and judge-advocate in the United States Army, and served until 1890 as assistant to the Judge-Advocate-General. He subsequently served successively as professor of law at West Point; staff officer to Major-General Merritt (1896-98); staff officer to Lieutenant-General Miles during the Spanish-American War; brigadier-general of volunteers; secretary and recorder of the Commission for the Evacuation of Cuba; deputy judge-advocate-general on the staff of Major-General Brooke, and judge-advocate-general. He published a series of *Lectures on Military and Martial Law*. At his own request he was retired, with the rank of brigadier-general, May 24, 1901.

CLOVE AND ORANGE. An Elizabethan 'Tweedledee-and-Tweedledum,' occurring in Jonson's *Every Man Out of His Humour*; "the Gemini of foppery, that, like a pair of foils, are fit for nothing but to be practiced on."

CLOVE - BARK. The bark of *Dicypellium caryophyllatum*, a little-known Brazilian tree, also found in the West Indies. As marketed, clove-bark resembles cinnamon cylinders about one-half foot long and about one inch in diameter, consisting of several pieces telescoped together. The bark is usually dark brown, smooth or slightly wrinkled, with a mucilaginous, aromatic, pungent taste, which suggests a mixture of cloves and cinnamon. In medicine it is known as *Cassia caryophyllata*, and is used like, but considered inferior to, cloves. A similar bark is said to be obtained from the *Myrtis caryophyllata* of Linnaeus, which grows in Ceylon. The eulilawan (sometimes eulilawang) of the Moluccas, which is sometimes confounded with clove-bark, is derived from *Cinnamomum* or *Laurus eulilawan*.

CLOVER (AS. *clafre*, trefoil, of unknown origin), or **TREFOIL** (*Trifolium*). A genus of plants of the natural order Leguminosæ, suborder Papilionaceæ, containing a great number of species, natives chiefly of temperate climates, abounding most of all in Europe, although about sixty species are indigenous to the United States; some of them very important, in agriculture, as affording pasturage and fodder for cattle and as a means for improving cultivated soil. The name 'clover' is also popularly applied to certain plants, which have compound leaves with three leaflets like the clovers, and also belong to the order Leguminosæ, but which are not included in the genus *Trifolium*—such as sweet or Bokhara clover (*Melilotus*), bur clover (*Medicago*), prairie clover (*Petalostemon*), bird's-foot clover (*Lotus*), and a number of others. The true clovers (*Trifolium*) have herbaceous, not twining stems; roundish heads or oblong spikes of small flowers, the corolla remaining in a withered state till the ripening of the seed; the pod inclosed in the calyx, and containing one or two, rarely three or four seeds. About seventeen species belong to the flora of Great Britain. The species of most importance to the farmer is the common red clover (*Trifolium pratense*). (For illustration, see Plates of DICOTYLEDONS and of BROODROOT.) This is a

growing in meadows and pastures. It stands in the front rank of forage plants for good yields, nutritive value, and adaptability to various climates and soils. It is a perennial, but is generally treated as if it were a biennial. Its heads of flowers are oval or nearly globular, very compact, about an inch in diameter, purple, more rarely flesh-colored or white; the tube of the calyx is downy; the stipules run suddenly into a bristly point. The leaflets have very often a whitish horseshoe mark in the centre. It is supposed that clover found its way into England from the Netherlands about the time of Queen Elizabeth; but it was not until the close of the last century that it was introduced into Scotland, where it is now universally prevalent. Perennial red clover (*Trifolium pratense pervicax*) is a somewhat harder form than the ordinary forms of common red clover and of longer duration, lasting for two years or more. The zigzag clover (*Trifolium medium*), also called meadow clover, marl-grass, and cow-grass, much resembles the common red clover, but is easily distinguished by the smooth tube of the calyx, and by the broader, less membranaceous, and gradually acuminate stipules. The stems are also remarkably zigzag, and are more rigid than in *Trifolium pratense*; the heads of flowers are larger, more lax, more nearly globose, and of a deeper purple color, and the leaflets have no white spot. It is a common plant in Great Britain and most parts of Europe, and is also grown to some extent in the United States. White or Dutch clover (*Trifolium repens*) is also a common native of Great Britain, and of most parts of Europe as well as of North America. When a barren heath is turned up with the spade or plow, white clover almost always appears. It is more permanent than common red clover, and it grows on nearly all soils, but its yield is small. White clover is seldom grown alone, but usually in mixtures of grasses and other clover. The flowers of all kinds of clover are the delight of bees, but those of white clover perhaps particularly so. Alsike or Swedish clover (*Trifolium hybridum*), a perennial, regarded as intermediate in appearance between the common red clover and the white clover, was introduced into Great Britain from the south of Sweden in 1834. It is also becoming common in North America. Crimson clover, or Italian clover (*Trifolium incarnatum*), an annual, native of the south of Europe, with oblong or cylindrical spikes of rich crimson flowers, is much cultivated in Continental Europe, and is also pretty extensively grown in some parts of England and the United States. Moliner's clover (*Trifolium Molineri*) very much resembles crimson clover, but is biennial and has pale flowers. It is cultivated in Europe. Alexandrian clover, or Egyptian clover (*Trifolium Alexandrinum*), an annual species, a native of Egypt, universally cultivated in its native country, where it is the principal fodder for cattle, is supposed to be one of the best kinds of clover for warm climates—such as, for instance, the Southern United States. It has oval heads of pale-yellow or whitish flowers. Yellow clover, or hop-trefoil (*Trifolium procumbens*), is common in dry, gravelly soils, but is not much esteemed. It has smaller leaves and flower-heads than has any of the cultivated species. The flowers are yellow, and the heads resemble miniature hop-strobiles.

Clovers are of great value to agriculture, on account of the many different ways in which they may be utilized. Clover is fed as hay, as green fodder, and as silage, and it is used for pasturage, for green-manuring, and as a cover-crop. It is chiefly valuable as a means of enriching the soil, being capable of appropriating free nitrogen from the air by means of its roots. It has long been recognized that clover-growing has a beneficial effect on the soil; but this phenomenon was not understood until about 1888, when scientists discovered that leguminous plants, through the agency of bacteria living in the characteristic tubercles or nodules on the roots, take up free atmospheric nitrogen. In the soil this nitrogen is oxidized to nitric acid, which forms nitrates, and in this form the nitrogen is assimilated by growing plants. In addition to their power of taking up free nitrogen, clovers are very valuable because of the large and deep development of their root systems, which effects a marked improvement in the physical condition of the soil, and thus indirectly increases its fertility. Plowing clover under for green manure is a most effective method of adding humus to the soil. During recent years crimson clover is recommended in the United States as a cover-crop for orchards, to be sown late in summer when the soil is no longer cultivated, and to be plowed under the following spring. In this way the soil is kept moist, its surface is kept from hardening, and much available plant-food is afforded the trees for the following season's growth. In general, the common red clover is the most important in the United States.

Feeding Value.—On an average red clover (green crop) has the following percentage composition: Water, 70.8; protein, 4.4; fat, 1.1; nitrogen-free extract, 13.5; crude fibre, 8.1; mineral matter 2.1. Red-clover silage contains—water, 72.0; protein, 4.2; fat, 1.2; nitrogen-free extract, 11.6; crude fibre, 8.4; ash, 2.6 per cent. Red-clover hay contains—water, 15.3; protein, 12.3; fat, 3.3; nitrogen-free extract, 38.1; crude fibre, 24.8; and ash, 6.2 per cent. Other clovers and their cured products resemble the above quite closely. Clover forage is relatively highly nitrogenous, is relished by all farm animals, and is capable of replacing in part more expensive concentrated feeding-stuffs—such as bran, linseed meal, etc.

Clover is very important for soiling, as it is available early in the season, and is relished.

Pigs do well on clover pasture, building good bone and framework, and fatten rapidly later on when given concentrated feed. Clover is very succulent in the green, uncured state, and therefore, like all such feeds, liable to cause bloat, if too much is eaten. Animals should not be turned on clover pasture when very hungry, or while the dew is on the clover. Some dry fodder should be placed in racks in the pasture, as this is said to relieve bloat.

Clover hay is not usually considered a satisfactory coarse fodder for horses, as the dust it carries proves detrimental. A limited amount may, however, be fed to all kinds of horses, with favorable results. It is a very satisfactory coarse fodder for milch cows. It furnishes the protein essential for milk, and is relished by the animals. By feeding clover hay as one-half to two-thirds of the coarse fodder of a ration, the amount of concentrated feed required may be

diminished, and thus the cost of the ration lowered. For calves and young stock, clover hay is very important. No other coarse fodder is superior for sheep.

As shown by experiments with ruminants, the following percentages of the nutrients in red-clover forage are digestible: Dry matter, 66.1; protein, 67.0; fat, 64.5; nitrogen-free extract, 77.6; crude fibre, 52.6; and ash, 55.0 per cent.

Red-clover hay has the following digestibility: Dry matter, 57.4; protein, 58.0; fat, 55.2; nitrogen-free extract, 64.4; crude fibre, 54.2; and ash, 29.1 per cent. In this respect it compares favorably with other coarse-fodder crops, both green and dry.

Clover Diseases.—There are two important fungus diseases of clover—a 'rust,' and what has been designated as the 'clover-rot.' The rust (*Uromyces trifolii*) is said to have first been noticed in South America, and to have come to the United States by way of Europe, where it is quite destructive. It infests the leaves, leaf-stalks, and stems, producing definite brown spots. The fungus passes through three phases—the first on the white clover, upon which minute cups are formed, filled with orange-colored spores; the other two phases, red and black (so called from the color of the spores occurring on red clover), are quite destructive. When a portion of a field is found affected, it is best to cover the clover with straw and burn it to prevent further spread. The 'clover-rot' (*Sclerotinia trifoliorum*) occurs on crimson clover in the United States, although common on red and other clovers in Europe. It also occurs on alfalfa, sainfoin, fenugreek, Bokhara clover, etc. Its presence may usually be noted by all plants being killed in patches a foot or more in diameter. Small black bodies will be seen at the base of the wilted stems in the autumn, followed by the appearance of small mu-hroom-like bodies in the spring. Burning, as mentioned above, and rotation of crops, are recommended for its suppression. A leaf-spot disease (*Pseudopeziza trifolii*) is sometimes quite destructive to clover and alfalfa. The diseased leaves show on their upper surfaces small black specks, which enlarge and extend through the leaf, destroying it. When present, this disease is liable to become epidemic, causing considerable loss. Burning over fields in autumn and frequent cutting prevent serious loss to the crop. Another destructive parasite of clovers, although not a fungus, is the dodder (q.v.).

CLOVER - INSECTS. Various insects injuriously affect cultivated clover, of which the following are prominent: The roots are attacked by borers, and the stems by a gall-making beetle (*Languria Mozardi*); also by a cutworm, the larva of the zebra-moth (q.v.). Weevils do great injury to clover in various parts of the plant; the worst species (*Hylesinus trifolii*) is an importation from Europe. These minute beetles pair in early spring, and then the female gnaws a cavity in a root of two-year-old clover and places it in four to six eggs. The larvæ, as soon as hatched, bore along the axes of the roots of the clover, causing the plants to weaken and often to die. Another beetle (*Phytonomus punctatus*), called the clover leaf-beetle, sometimes appears in swarms, coiling about the tips of the leaves. The leaves are also attacked by a midge or gall-gnat and the seeds by another (*Cecidomyia legu-*

minicola), the latter of which is very destructive. It lays its eggs in the blossoms of red clover in May and June, and these hatch into small reddish or yellowish maggots, which destroy the forming seed. Upon reaching full growth, they wriggle out from the floret and fall to the ground, transforming to pupæ within delicate, spherical cocoons, from which the adults issue the following spring. The larvæ leave the florets just before the time of cutting the first crop of clover for hay, so that if the time of cutting for this crop be advanced two weeks, the insect will be destroyed. Another enemy to the seeds is the greenish caterpillar of a moth (*Grapholitha interstinctana*), which devours florets and seed-vessels. The clover-hay worms, caterpillars of pyralid moths, especially *Asopia costalis*, affect particularly stored hay in which clover is mixed.

CLOVES (from Fr. *clou*, from Lat. *clavus*, nail, so called from the shape). The dried flower-buds of the clove-tree, *Caryophyllus aromaticus*, of the natural order Myrtaceæ. The clove-tree is from 15 to 40 feet high, evergreen, with a beautiful pyramidal head. The flowers are small, but produced in great profusion in cymes. The leaves, flowers, and bark have an aromatic odor. The ripe fruit resembles an olive in shape, but is not quite so large; it is of a dark-red color; it sometimes appears in commerce in a dried state, under the curious name of 'mother cloves': it has an odor and flavor similar to cloves, but much weaker; the broken fruit-stalks are sometimes also used for the same purposes as cloves, but the flower-buds themselves are the principal product of the tree. They are gathered, and are dried by exposure to the smoke of wood-fires, and afterwards to the rays of the sun, or by the latter alone. When first gathered they are reddish, but become of a deeper-brown color. The unexpanded corolla forms a little round head at the end of the calyx-tube, which is about half an inch long, and thus the appearance is not unlike that of a little nail, whence the name. The clove-tree is a native of the Spice Islands, but is now cultivated in Sumatra, Bourbon, Mauritius, some parts of the West Indies, and elsewhere. For illustration, see Plate of FLAVORING-PLANTS. The wild clove-tree of the West Indies is *Pimenta acris*. See MYRTACEÆ.

The properties of cloves depend chiefly on an essential oil—oil of cloves—which forms one-fifth or one-sixth of the whole weight, and is used for flavoring dessert dishes and articles of confectionery. The oil of cloves is obtained by repeatedly distilling cloves with water, when two oils pass over, one of which is lighter and the other is heavier than water. The oil has a hot, acrid taste, is light-yellow when pure, and browned when not so carefully prepared. It has a characteristic odor, and is soluble in ether, alcohol, and the fixed oils. When taken internally in small quantities, it has the effect of aiding digestion and of stimulating the appetite. It is sometimes used in medicine as a stomachic, carminative, and antispasmodic, and is often added to scammony and castor-oil to prevent the griping that is likely to be caused by those substances. Oil of cloves is further employed in scenting soaps, and by the distiller. The chief constituents of the oil are eugenol, or eugenic acid, $C_{10}H_{12}O_2$ and a terpene, $C_{15}H_{24}$.

CLOVES, OIL OF. See CLOVES.

CLOVIO, klôv'è-ò. GIULIO, called MACEDO (1498-1578). A miniature painter, born in Croatia. He went to Italy as a youth, and rapidly won favor by his paintings and by engravings on medals and seals. He received some instruction from Giulio Romano in Rome, and Girolamo de Libri in Verona. About 1527 he became a monk, and afterwards lived principally in Mantua and Perugia. His works were executed for the princes of the day; and, despite the many figures and exquisite finish of the illuminations, he produced a great number of them. The most famous is a breviary, with twenty-six scenes, done for Cardinal Farnese, and now in the Naples Museum. A marvelous production is the life of Frederick of Urbino, in the Vatican Library. This work shows Clovio's qualities as an historical painter and portraitist, the genre in which he is most successful.

Consult: Sakeïnski, *Das Leben des Giulio Clovio* (Agram, 1852); and Bertolotti, *Don Giulio Clovio, principe dei miniatori* (Modena, 1882).

CLOVIS, CHLODWIG, or CHLODOVECH (c.466-511). A king of the Franks, of the line of the Merovingians. By the death of his father, in 481, he became King of the Salian Franks, whose capital was at Tournai, in what is now the Belgian Province of Hainault. His first achievement was the overthrow, in 486, of the Gallo-Romans under Syagrius, near Soissons, after which he extended his conquests to the Loire. Clovis did not dispossess the inhabitants, as the Franks were only few in numbers, and the public lands were sufficient for them. About 493 Clovis married Clotilda, daughter of a Burgundian prince. Clotilda was a Christian, and earnestly desired the conversion of her husband, who, like most of the Franks, was still a heathen. In a great battle with the Alemanni, in 496, Clovis was hard pressed, and, as a last resource, invoked the God of Clotilda, vowing that he would become a Christian if he obtained the victory. The Alemanni were routed, and on Christmas day of the same year Clovis and 3000 of his army were baptized by Remigius, Bishop of Rheims. Love of conquest concurring with zeal for the Orthodox faith, Clovis marched to the southwest of Gaul against the heretic Visigoth, Alarie II., whom he defeated and slew at Vouillé, taking possession of the whole country as far as Bordeaux and Toulouse (507-10). Clovis now took up his residence in Paris, where he died in 511. His great aim had been the subjugation of all the Frankish princes and the union of the whole Frankish people into a single powerful kingdom. The means he employed to secure this end were cruel and unscrupulous; but the end itself would have been beneficial, if he had not frustrated it at his death by redividing the newly organized realm among his four sons, and exposing it to the very perils from which he himself had rescued it. An account of the deeds of Clovis may be found in Gregory of Tours, *Historia Francorum*, Book II., edited by Guadet and Turanne (Paris, 1836-38). Consult, also, Junghaus, *Geschichte der fränkischen Könige Childerich und Chlodwig* (Göttingen, 1857).

CLOWES, klouz, WILLIAM LAIRD (1856—). An English naval critic, who wrote under the name of 'Nauticus.' He was born at Hampstead, and was educated at King's College, London, and

at Lincoln's Inn for the law, which he abandoned for journalism. He served on the *Standard* (1885), *Daily News* (1887-90), and *Times* (1890-95), and contributed largely to English and foreign magazines. His articles on needs of the navy, battle-ships, torpedo-boats, etc., became widely known. He was editor and part author of *The Royal Navy: A History from the Earliest Times to the Present* (6 vols., 1897-1901). Among his numerous works are: *The Naval Pocket-Book* (an annual); *Confessions of an English Hachish-Eater* (1883); *Black America: A Study of the ex-Slave and His Late Master* (1892); *Blood is Thicker than Water* (1894); a volume of poems entitled *Eclorges* (1899).

CLOWN. See JESTER; PANTOMIME.

CLUB. A word said to be derived from the Saxon *clōfan*, to divide—a club being an association, the expenses of which are shared among the members. Societies of somewhat the same nature existed in ancient Greece and Rome, and mention of them is made in Aristotle, Cicero, Plutarch, and other ancient writers. The modern club, however, had its origin in the London taverns and coffee-houses. Thomas Oeeleve, who wrote in the reign of Henry IV., mentions 'La Court de Bonne Compagnie,' of which he was a member; but the first celebrated club in London is that to which belonged Shakespeare, Fletcher, Raleigh, Beaumont, and other brilliant men of letters who met at the Mermaid Tavern in Bread Street. Ben Jonson founded a club which met at the Devil Tavern, for which he is supposed to have written his *Leges Courivales*. The Calves' Head, so named in allusion to Charles I., was a famous London club, which existed in the latter part of the seventeenth century and the early part of the eighteenth century, and whose members banqueted on January 31 on a calf's head.

In 1659 the first political club, the Rota, was established and met at the Turk's Head in New Palace Yard. The famous 'Octoberale' served at the October Club was another political institution of which Swift became the leading spirit after his conversion to Toryism. The Literary Club, established in 1764 by Sir Joshua Reynolds and Dr. Johnson, of which Goldsmith, Gibbon, Garrick, Burke, and other celebrated men of letters were members, afforded a meeting-place for congenial spirits, where they could freely discuss the merits of the contemporary literary productions and their authors. Its membership was limited, and Garrick found it difficult to gain admission. This club still exists in London. It is usually called the Literary Club, but its members have always claimed for it simply the title of 'The Club.' The King's Head Club, founded by the unscrupulous Shaftesbury, and the Mug House Club, so called on account of the ale-mugs used by its members, were noted political clubs of the early part of the eighteenth century. The Kit-Kat, established about 1700, was named after Christopher Katt, a noted mutton-pie man. Its members toasted some celebrated beauty, whose name was inscribed on the toasting-glass in verse. The Dukes of Marlborough and Devonshire, Sir Robert Walpole, Congreve, Granville, and Addison were members of the Kit-Kat. About the same time existed the Tattler's Club in Shire Lane, and the famous Beefsteak Society, whose members wore badges inscribed with the motto, 'Beef and Liberty.' Its members were called 'Steaks.' Hogarth, Fox,

Sheridan, and the Duke of Clarence were among its noted members. As already said, these clubs had their origin in the taverns and coffee-houses of London. To this class belonged Almack's, established in 1764, and White's, established in 1698, as White's Chocolate House, and removed in 1755 to Saint James Street. Brooks's was established in 1764, and Boodle's, a famous resort for country squires and hunting-men, in 1762.

It is, of course, very easy to understand the genesis of clubs such as White's and Brooks's. In those days men's personal associations depended chiefly on party affiliation. Tories lived with Tories, and Whigs with Whigs. Intermarriages between persons of different political families were not common. Hence, men flocked to those taverns and public-houses where they would meet members of their own party. The next step was easy and obvious. The proprietor would agree, of course for a consideration, to exclude persons whose company would not be agreeable to the habitués of the place. It was thus that White's and Brooks's were formed, White's being a Tory and Brooks's a Whig club. These clubs are known as 'proprietary clubs,' to distinguish them from those of which the members were the owners. The latter class of clubs is, of course, the more recent.

About 1815, after the termination of the Napoleonic wars, the restaurant or dining-room was introduced into the clubs. Many army and navy officers, being no longer needed in active service, were placed on half pay, and were thus compelled to observe a strict economy. By combining their resources, they could live well and much more cheaply than when having their meals alone. From that time on, the number of clubs in England increased, until at the present day there are more than one hundred prominent clubs in London. These may be roughly divided into the following classes: Purely social clubs, to which belong Arthur's (established in 1765), with a membership of 600; the Bachelor's Club (established in 1881), with a membership of 920, admitting ladies as visitors; the Grosvenor (established in 1883), with a membership of 3000; the Junior Athenæum (established in 1864), with a membership of 500; the Piccadilly (established in 1893), with a membership of 1500, admitting ladies as visitors; the Union (established in 1822), with a membership of 1000; the Wellington (established in 1885), with a membership of 1400; the Travellers' Club (established in 1819), with 800 members. To this last club no one may belong who has not traveled for 500 miles in a direct line from London. This rule was made just after the cessation of the Napoleonic wars, during which traveling on the Continent was difficult. Among the clubs whose main purpose is political is the Carlton (established in 1832), which has a membership of 1800, and is Conservative; the Conservative (established in 1840), with a membership of 1300; the Constitutional (established in 1883), with a membership of 6500; the Junior Carlton (established in 1864), with a membership of 2100, and strictly Conservative. The Junior Conservative and the Junior Constitutional have each a membership of 5500, and are Conservative; the Primrose, established in 1886, has a membership of 5000, and is Conservative; the Reform, established in 1837, has a membership

of 1400, and is Liberal; the City Liberal, established in 1874, has a membership of 900, and is Liberal.

Among the literary, musical, artistic, and scientific clubs stand out preëminently the Athenæum, founded in 1824 by Sir Walter Scott and Thomas Moore, its members numbering 1200. It is devoted to art, science, and literature. The Press Club, established in 1882, is strictly journalistic; the Garrick, established in 1831, is the home of actors and of the patrons of the drama; the Royal Societies, established in 1894, is composed of 1700 members belonging to the learned associations. The principal clubs patronized by military and naval officers are as follows: The Army and Navy (established in 1837), with 2400 members; and the Junior Army and Navy (established in 1869), with 2000 members, including among them officers of the army, navy, marine, yeomanry, and militia.

The two principal commercial clubs are: the City of London (established in 1832), with a membership of 800, the home of merchants and bankers; and the Gresham (established in 1843), with a membership of 475, and with a like clientèle.

Some of the leading athletic and sporting clubs are: The Alpine (established in 1857), devoted to mountain exploration; the Automobile (established in 1897), and interested in motor locomotion, with a membership of 1036; the Hurlingham, whose members number 1200, devotees of polo and pigeon-shooting. The M. C. C. (Lord's) Club (established in 1787) is the headquarters for cricket, and has a membership of 4700; the Prince's Racquet and Tennis (established in 1833), with a membership of 1500, devoted to the practice of these games; the Renelagh, devoted to polo, golf, etc. (established in 1894), with a membership of 1900. The Leander and the Thames are among the principal rowing clubs in England. The New Oxford and Cambridge, composed of the members of those universities, was established in 1884 for the purpose of bringing graduates of those institutions into closer social relations, and has a membership of 900; the United University, also composed of Oxford and Cambridge men, has the same aim in view; the University for Ladies (established in 1887) is composed of women educated at universities and medical colleges. These are the principal university clubs of England. The Saint James Club, established in 1857, has a membership of 650, and is the rendezvous for diplomats. The Royal Yacht Squadron is the leading yacht club, and is a very exclusive institution. These clubs are all housed in buildings that are remarkable for their architectural magnificence and for the completeness of their interior appointments. They combine the comforts of a home and the service of a hotel without the responsibility of the one or the publicity of the other, and are conducted at a comparatively moderate expense to the individual members.

Attempts to introduce clubs in Continental Europe long met with little success. In Germany, such associations were discountenanced by law. The first club established in France in 1782 had politics for its main object, and went by the name of 'Le Club Politique.' Among the clubs that played an important part in the French Revolution may be noted the Jacobins; the Feuillants; the Montrang, of which Mirabeau

and Latoutche were prominent members; the Cordeliers, and others. Purely social clubs have also been established in Paris. First among them are the Jockey Club and the Cercle Royal, the most fashionable and exclusive clubs in Paris. The Club de Boston was established in 1885.

In the United States clubs were first introduced in the latter part of the eighteenth century. The Hoboken Turtle Club, organized in 1797, is still in existence. Such a club was, however, of slight importance in the social life of the town. In the city of New York the pioneer club, in a modern sense, is the Union Club, established in 1836. It is one of the oldest and most exclusive in New York City. Its membership is limited to 1500, and its object is purely social. The Century Club, organized in 1846, has the promotion of art and literature in view. Membership is limited to authors, artists, and amateurs in letters and the fine arts, and must not exceed 1300. The Union League Club was founded in 1863 for the purpose of discountenancing any attempt to impair the integrity of the United States. The New York University Club, composed of college and university graduates, was incorporated in 1865. None except degree-holding persons are eligible for membership. Its aim is literary and artistic. One of the most exclusive clubs in New York, the Knickerbocker, was organized in 1871. Its purpose is purely social. The Lotus Club, organized in 1870, is the home of journalists, authors, artists, musicians, and friends of literature. Resident membership is limited to 500. The Catholic Club of the City of New York has for its primary interest the promotion of Roman Catholic interests in New York, and has existed since 1863. The Calumet, a purely social organization, was established in 1879. Its membership is limited to 500. The Manhattan Club is a powerful factor in Democratic politics of New York. Its membership is limited to 1500, and it has an actual enrolled membership of 1200. It was organized in 1864, in opposition to the Union League Club. The Reform Club has for its object the promotion of good government and the abolition of the protective tariff. It was organized in 1878. The United Service Club was organized in 1889 for the promotion of military science. Membership is limited to military and naval officers. The Players' Club was organized in 1888, to promote social intercourse between the different members of the dramatic profession. This club was founded by Edwin Booth, who left the house, with its furniture and pictures, to the association.

Social clubs have also been formed exclusively for women. It would seem that these should have a *raison d'être*, especially in the United States, where ladies' luncheon-parties, at which the company of no man is expected or desired, are so popular. Women's clubs are, however, ancient institutions. There were a number of them in ancient Rome, among them an assembly of matrons known as the 'Minor Senate.' This institution received imperial recognition. It was chiefly occupied with questions of etiquette—such as the kind of dress that ladies should wear, according to their social position; the question as to who might be driven in carriages drawn by horses and who should be compelled to drive mules; whose sedan-chairs should have ornaments of ivory and whose

of silver, and other weighty problems. The modern ladies' clubs have, therefore, the authority of a very ancient example. They would seem to have a reason for existence in the gregarious and social instincts of the sex; but it is probable that the popularity of these clubs has been affected by the admission of ladies to certain of the privileges of the men's clubs—a privilege which renders special clubs for women less necessary.

There is still another class of clubs, such as the *Liederkrantz* and the *Arion* in New York, the original purpose of which was musical. These clubs have one point of special interest; they are German in their origin rather than English. If the English public-house, to which, of course, it was not the custom to admit women, is to be taken as the origin of the typical club of the present day, the German beer-garden may be viewed as the origin of such clubs as the *Liederkrantz* and the *Arion*. The German went to the beer-garden in company with his wife and daughter, or his sweetheart; and so, in the modern German clubs of New York, the men are usually accompanied by the women.

It seems to be a recent tendency of clubs, particularly in the United States, to facilitate, so far as is possible, the admission of ladies to club privileges. In many of the clubs it is possible for members to bring ladies to dine—a thing unheard of in England until twenty years ago, and at that time scarcely known in America. The Bachelors' Club in London, founded about twenty years ago, admitted ladies as visitors under certain conditions; and that club is one of the most successful in London. Other clubs have been founded which have the same characteristic; but the innovation has not proved so popular in England as in the United States.

The degree to which ladies are to be permitted to share the privileges of men's clubs is becoming an interesting subject. During certain hours the club must, in the nature of things, always remain sacred to men. They cannot have that comfort and unrestraint when ladies are present which they can have by themselves. During the morning hours it is natural that the ladies should be excluded. And there are also many men to whom the presence of women in the clubs in the evening would not be agreeable. The division of men into those who prefer to spend their evenings in their domestic circle and those who prefer to pass them with other men seems to be inevitable and permanent.

As we have seen, the modern club, originating in England, has spread all over the world. It is necessary, of course, that the club in each country shall have to some extent the characteristics of that country. For instance, in a French club, a newcomer must ask to be introduced to the members of the club, that being, in general, the French habit. His failure to do so would be resented by the members. In England, on the contrary, a man newly admitted would never think of asking to be introduced personally to the members. Certain differences between English and American society appear in the club life of the two countries. In general, it may be said that there is greater sociability in American than in English clubs. Indeed, the ideals of club life in the two countries are, or at any rate were, essentially dissimilar. Early in this century Englishmen found that it was possible for an individual to live at a club for £600 a year as

well as he could live at home for £6000. In the club he could have everything that he could have at home except the privacy of his own house. If he could not quite have that, he wished to have something as near it as might be. Hence the original character of the English club was somewhat solitary and unsocial. Another difference between English and American clubs was originally this: The men who founded the great English clubs were either without occupation or at most half employed. The club was, therefore, with them a place to live in and to spend a large part of the day. The American clubs, on the contrary, were originally founded by men fully employed, for purposes of social relaxation. Their early equipment, as a rule, was two or three rooms, where business men could meet outside of business hours and talk. From such a nucleus as this have grown up in our cities the great houses with library, restaurant, billiard-rooms, baths, and other appliances of luxurious living.

The present tendency, however, seems to be for English and American clubs to assimilate in character. In England the clubs have extended through all the classes of the community, so that in many of them membership consists fully as much of business men as it does here. In the United States, on the other hand, the number of unemployed or half employed men is very much on the increase, so that the men who use clubs as places to live in have greatly increased in number. It is said, by those who are in a position to know, that the sociability which has characterized American clubs has extended to these societies in England and is on the increase among them.

Regarded from a legal point of view, a club may be incorporated or unincorporated; but it is essential to its character as a club that it shall not be instituted for trading purposes, and shall not carry on any occupation having gain for its object. Social clubs, as we know them, are of English origin and have usually been unincorporated, the earliest—such as White's, Brooks's, 'The Beefsteak,' and other celebrated resorts in London—being of the proprietary kind, one person furnishing the club premises and all accessories, in consideration of an entrance fee and fixed annual subscriptions, the members being mere licensees and not co-proprietors. This type of club still survives in England and has of late become quite common in convivial and sporting circles in New York, Chicago, San Francisco, and other large cities of the United States. Gaming clubs are usually conducted on this principle.

The more usual and familiar type of club at the present time, however, is the 'members' club,' in which the persons constituting the association are, by virtue of their membership, co-owners of the property of the club and equally entitled to share in its privileges. The legal relation between the members is that of mutual contracting parties, the terms of the agreement creating their mutual rights and obligations being contained in the articles of association and in the rules and regulations adopted thereunder. These articles and rules also fix the powers and determine the authority of the governing board and other officers and committees of the club, each member being bound to submit to such authority by his express or implied assent to the rules and regular proceedings of the club. Every new member becomes a party to the con-

tract of association, whether he formally subscribes to its articles or not, though it is usual to make such subscription.

The proceedings of social clubs have not often come before the courts for review, and when they have, it has usually been in connection with the exercise of the right of expulsion of an obnoxious or offending member. This is generally provided for and regulated by the rules of the club, and, in general, it may be said that any member who brings himself by his conduct within the condemnation of the rules may be expelled in the manner provided by them, or, in the absence of any express provision, by the vote of a majority of its members. But the courts are not blind to the serious consequences of an expulsion, especially in the forfeiture of the property rights which it involves, and will see that the offending member has fair play. He is entitled to a hearing and to reasonable notice, whether the rules of the club provide for it or not. The governing committee is a quasi-judicial tribunal and must act as such. But if the proceedings have been regular and fairly conducted, the courts will usually make no further inquiry. They will not, under ordinary circumstances, undertake to control the discretion of the association or its committee, or to determine what is and what is not proper conduct on the part of a member. Doubtless, however, if it appeared to the court that a member against whom proceedings have been taken was the victim of unreasonable prejudice or of a conspiracy, it might order his reinstatement.

Generally speaking, the individual members of unincorporated clubs are not liable for the debts of the concern, unless they have authorized the transactions out of which such debts arose—a voluntary club not being a partnership and no agency being presumed; but the assent necessary to bind the members individually may be given by resolution under the rules. Of course, where no agency or ratification can be shown, the steward or house committee or other officer making or directing a purchase becomes personally liable upon the obligation incurred, the club, as such, having no legal status. An incorporated club, however, like any other corporation, may sue and be sued in its corporate capacity; and its officers and members, so long as they have complied with the law, are equally free from individual liability for its debts. For this and other reasons it has become a common practice to incorporate clubs of this character. But incorporation does not involve the existence of a capital stock, in the ordinary sense of that term, nor of corporate shares, nor has a club-member usually a transferable interest. (For a remarkable exception to this rule, see STOCK EXCHANGE.) For the dissolution of an incorporated club, legal proceedings are necessary; but a voluntary, unincorporated association may be dissolved informally by mutual agreement of its members, and thereupon the property of the club is distributed equally among them.

Although a club is not a place of public entertainment, i.e. neither a tavern nor a hotel, within the meaning of excise legislation, it may nevertheless be brought by statute under public regulation. Of course, the proprietor of a 'proprietary club' is subject to the same laws as any other persons buying and selling intoxicating liquors. It has been held, however, that the fur-

nishing of wine, beer, etc., to a member of a 'member's club' is not 'giving or selling' liquors within the excise laws. A club may also be a common gambling-house under the law if its members in considerable numbers habitually congregate there for purposes of gaming. See CORPORATION; JOINT STOCK ASSOCIATION; VOLUNTARY ASSOCIATION; and the authorities there referred to. See, also, BOYS' CLUBS; GIRLS' CLUBS; WOMEN'S CLUBS; WORKING MEN'S CLUBS; WORKING WOMEN'S CLUBS. Consult also Wertheimer, *Law Relating to Clubs* (2d ed., London, 1889).

CLUB, THE. A group of discontented Whigs in the Scotch Convention of Estates, led by Montgomery, Annandale, Ross, and Hume, who for a time during 1689 and 1690 succeeded in blocking all legislative business.

CLUBFOOT (in Lat., *talipes*). A deformity of the foot, due to a distortion of one or more of the joints, and characterized by extreme extension, flexion, adduction, abduction, or rotation. Surgeons recognize several varieties: a turning in of the foot (*talipes varus*), a turning out (*talipes valgus*), an elevation of the heel so that the weight is borne on the ball of the foot and the toes (*talipes equinus*), and a depression of the heel with the front of the foot raised from the ground (*talipes calcaneus*). Two of these forms are frequently combined (*equinovarus*). We may also mention here the deformities flatfoot (*pes planus*), where the arch of the foot is lost, and its opposite (*pes cavus*), where this arch is unduly exaggerated.

Clubfoot is either congenital or acquired. When acquired, the deformity is usually due to infantile paralysis (anterior poliomyelitis). The changes involve the muscles, tendons, bones, and ligaments. The treatment is manual, mechanical, or operative. Considerable improvement can be obtained in congenital cases by the first method, but those of long standing require splints or special apparatus, or surgical interference with sections of the tendons and frequently removal of parts of the bones. The first operation for clubfoot was done in 1731, by Stromeyer. Consult Gould and Pyle, article "Talipes," in *Cyclopaedia of Medicine and Surgery* (Philadelphia, 1901).

CLUB-HOUSE. A building used as the headquarters of a club. While of no particular importance in European countries, the club-houses of England and the United States are, for architecture and comfort, one of the foremost classes of contemporary buildings. The University Club in New York has perhaps the most magnificent halls and fittings.

CLUB-MOSS. The common name of the species of Lycopodium and Selaginella. The plants resemble coarse mosses, and frequently bear club-like cones (strobili) of spore-bearing leaves. They are also sometimes called ground-pines. See LYCOPODIALES; PTERIDOPHYTES.

CLUBROOT, or ANBURY. A disease to which turnips, cabbages, cauliflowers, rutabagas, and allied plants are liable, and which often proves of serious importance to farmers, destroying the crop of entire fields. It is called clubroot because of the knobs or tubercular excrescences which form upon the root. The root often becomes divided into a number of parts, each in some small degree swelling separately by itself; whence the popular name, 'finger-and-toe disease.'

The disease is caused by *Plasmodiophora brassicae*, a fungus of low order, which multiplies with great rapidity in the cells of the host. This acts as a stimulus, causing the roots to assume their strange appearance. The fungus can remain in the soil for a number of years. On this account, care should be taken to rotate crops, so that no cruciferous plants shall be grown on the infested land for several years. The seed-bed is often a source from which the disease is spread, and it should receive attention. The application of lime to contaminated soil, at the rate of 75 bushels per acre, has given promising results. No cure is known.

CLUB-RUSE. See SCIRPUS.

CLUGNY. See CLUNY.

CLUMBER SPANIEL. See SPANIEL; and Plate of TERRIERS, SPANIELS, ETC., under DOG.

CLUMSY, SIR TUNBELLY. A boorish country squire in Vanbrugh's play *The Relapse*. He also appears in Sheridan's *Trip to Scarborough*.

CLUNCH. Old Madge's husband in Peele's *Old Wives' Tale*, who brings home three travelers to form an audience for his loquacious better half.

CLUNIACS, or CONGREGATION OF CLUNY. A branch of the Benedictine Order, founded at Cluny in France about 910, by William, Duke of Aquitaine. He placed at its head Berno, who had made a great reputation by his conduct as abbot of the monasteries of Gigny and Baume. It spread rapidly, and at one time had more than 2000 convents, mainly in Italy and France, all connected with the house at Cluny. In England the first Cluniac house was founded in 1077. At the time of the suppression of the monasteries there were thirty-two houses. The Congregation in France was dissolved in 1790 by the Constituent Assembly; the town of Cluny purchased the magnificent Abbey Church for 100,000 francs and pulled it down. When, a few years later, the citizens invited Napoleon to visit them, he dismissed them contemptuously, calling them vandals. In Paris the present Hôtel de Cluny was begun in the fifteenth century (on the site of the old palace of the early Frankish kings) by the Congregation of Cluny, but is now a rich museum owned by the city of Paris. The Congregation was reformed by Peter the Venerable (q.v.), and in 1131 Innocent II. dedicated the great church of Cluny; which was one of the wonders of the world. Among the great men whom the Congregation has produced are Popes Gregory VII., Urban II., and Paschal II.

CLUNY, klŭ'nĕ', or CLUGNY (Lat. *Cluniacum*, probably connected with Oir. *chain*, Ir. *clon*, meadow, Gk. *κλέρος*, *klepos*, moisture, Lith. *slāpius*, wet). A town in the Department of Saône-et-Loire, France, 12 miles northwest of Macon. It has manufactures of pottery, paper, etc. Population, in 1901, 4108. Its architectural attractions include, besides the celebrated abbey, the Church of Notre Dame, dating from the thirteenth century; the Church of Saint Marcel, with a beautiful Romanesque steeple of the twelfth century; the ruins of Saint Mayeul; portions of the ancient fortifications; and picturesque houses, dating from the twelfth century and later, all classed among the historical monuments of France. Before the erection of Saint Peter's at Rome, the Abbey Church at Cluny, which was begun in 1089, was the largest building of its kind

in Europe, being 650 feet long by 130 wide. It is now in ruins, having been destroyed by order of the town, to which it was sold after the convent was suppressed by the Constituent Assembly in 1790. (See CLUNIACS.) A model of it is preserved in the town museum, which was once a part of the abbot's palace. Consult: Bernard, *Les chartes de l'abbaye de Cluny* (Paris, 1876-94); Duckett, *The Archives of the Ancient Abbey of Cluny* (n.p. 1886).

CLUNY, klŭ'nĕ', HÔTEL DE. A fine Gothic edifice in Paris, built during the fifteenth and sixteenth centuries by the abbots of the Benedictine Abbey of Cluny, on the site of an ancient Roman palace. In 1515 it was occupied by Mary, the widow of Louis XII., and in 1537 James V. of Scotland was married in it. It passed into the hands of the nation after the Revolution, was acquired in 1833 by the antiquarian Du Sommerard, and in 1842 was purchased with its collections by the State. The museum established in it is important for its antiquities, particularly of France.

CLUPEIDÆ (Neo-Lat. nom. pl., from Lat. *clupca*, small river-fish + Gk. *εἶδος*, *eidos*, shape, form). An important family of soft-rayed fishes, including the herring, shad, sardines, alewives, etc. (q.v.). The body is usually elongated and compressed; the head naked; the body covered with rather large scales, usually easily lost. The lateral line is wanting. There is only one dorsal fin, and the tail is forked. There are about 30 genera and 150 species found in all seas, and usually in immense shoals. Many species are anadromous, while some remain in fresh water permanently. See FISHERIES and FISH CULTURE.

CLUSERET, klŭ'z-râ', GUSTAVE PAUL (1823-1900). A French soldier and Communist, born in Paris. He was educated at Saint-Cyr, distinguished himself during the insurrection of 1848 in Paris, served in the Crimean War and in Africa against the Kabyles, and became a captain in 1855. In 1858 he resigned his commission, and in 1860, as commander of the French volunteers, joined Garibaldi in the expedition to Sicily and Naples. At the outbreak of the American Civil War in 1861 he came to the United States, entered the Union Army, served on the staffs of McClellan and Frémont, and became brigadier-general in 1862. Two years later he was editor of *The New Nation* in New York, advocating the nomination of Frémont for the Presidency. Returning to Europe, he took part in the Fenian revolt of 1867, went back to France in the same year and wrote for several radical papers, but was condemned for certain publications and compelled to take refuge in England. On the proclamation of the Republic in September, 1870, he took part in the insurrectionary attempts at Lyons and Marseilles, whence he fled to Geneva. In January, 1871, we find him in Paris where, after the establishment of the Commune, he was appointed delegate of the War Department, and endeavored to improve the military organization of the Communist troops, but soon gave offense to the Central Committee, was accused of treachery, and was imprisoned at Mazas. When the Government troops entered Paris, he escaped to England, thence to Mexico, and finally to Switzerland. In 1872, during his absence, he was formally sentenced to death; he returned to France in 1881, two years after the amnesty, and

was elected to the Chamber of Deputies in 1888, 1889, and 1893. He died August 21, 1900, near Toulon. He published *Mémoires du général Cluseret* (1887-88).

CLUSIUM, κλω'shī-ūm. An ancient town of Italy, the modern Chiusi (q.v.).

CLUSTER-CUP. See **ÆCIDIUM**; **UREDINALES**.

CLUSTERED PIER, or **COLUMN**, or **COMPOUND PIER**. A form of architectural support characteristic of the Middle Ages, though not absolutely unknown to the ancient East, as is shown by the Babylonian cluster of four columns found at Telloh. It was not used in the Classic, Early Christian, or Byzantine style, nor until the development of the vaulted Romanesque in the eleventh century. It probably originated in the attempt to vary the plain square pier which was then being used in place of the classic column, and to connect it with moldings of the arcades and the ribs of the vaulting. These Romanesque piers had a square or rectangular core, to each face of which a semi-column or engaged shaft was attached; this simplest form was varied by the addition of minor shafts and re-entrant angles. Very rich effects were thus obtained, especially in central France and England during the twelfth century. The developed Gothic style of the thirteenth century adopted the clustered pier as its regular support in interior architecture. The Gothic pier differed in being usually far slenderer, more varied in plan, and in a majority of cases based on a circular or polygonal instead of a square core. The larger shafts were sometimes—especially in England—separated from the core, to which they were fastened only at the base and at the capital and by intermediary molded bands. But this form was found unsatisfactory and was abandoned except in England for the solid pier, which was a better support. Its simplest form with circular core is shown in the nave of Amiens Cathedral, but its variations are infinite, being determined largely by the number, form, the grouping of the vaulting ribs and moldings above, by connecting with which the effective sweep of architectural lines is continued from floor to vaulting ridge. The neo-classicism of the Renaissance put an end to the clustered pier almost entirely except in its simplest rectangular forms.

CLUTTERBUCK, CAPTAIN CUTHBERT. A retired officer, the fictitious editor of Scott's *The Abbot*, *The Monastery*, and *The Fortunes of Nigel*.

CLUVER, κλω'vēr, or **CLÜVER**, κλυ'vēr, PHILIPP (1580-1622). A German antiquarian and geographer, born in Danzig. He first studied law in Leyden, but soon forsook it for archaeology and geography, whereupon his father withdrew all support and he was obliged to take service in the Austrian Army. From 1607 to 1613 he traveled through Norway, England, Scotland, France, Germany, Switzerland, and Italy, and in 1615 he settled in Leyden, where he was made 'Geographus Academicus.' In 1617-18 he roamed once more through Italy and Sicily, on foot and under great hardship. He was the founder of historical geography and author of *Germania Antiqua* (1616); *Sicilia Antiqua* (1619); *Italia Antiqua* (1624), his principal work, and *Introductio in Universam Geographiam* (1624).

CLYDE (called *Glotta* by Tacitus, connected with Olr. *Cluad*, name of a river, Gk. κλύζειν, *klyzein*, to wash out, Lat. *cluere*, to purify, Goth. *hlūtrs*, AS. *hlāttor*, Ger. *lauler*, pure). The third in size, commercially the most important, river in Scotland, widely celebrated for the romantic beauty of its scenery (Map: Scotland, D 4). It is formed by several large streams of the semicircular range of the Lead, Lowther, and Moffat hills, and drains the counties of Lanark, Renfrew, and Dumbarton, flowing past Lanark, Hamilton, Glasgow, Renfrew, and Dumbarton, near which town it opens into the Firth of Clyde. In this course it receives a number of streams, and flows through a fertile, wooded valley, often extending into level plains, and often having bold, wooded banks. From two miles above to four miles below Lanark are the celebrated Falls of the Clyde—a series of cascades and rapids, the largest in Scotland; the total descent in the course of six miles being 230 feet, over Old Red Sandstone rocks, amid very picturesque scenery. Corra Linn, the grandest fall, forms three distinct leaps—in all 84 feet high. Below Glasgow the Clyde expands into an estuary, navigable by the largest vessels, and at Greenock it attains a breadth of about four miles. Opposite this point it communicates with the Gareloch, and a little below, with Loch Long on the north, and turning, expands into the Firth of Clyde, which extends between Argyll, on the west, and Renfrew and Ayrshire, on the east, until it becomes identified with the North Channel at the island of Ailsa Craig, where its breadth is about 30 miles. In the Firth of Clyde are the islands Arran, Bute, Great Cumbrae, and Little Cumbrae. In the north a narrow arm, called Loch Fyne, extends far into Argyllshire. The Clyde from its source to Glasgow is, by its windings, 75 miles long, and from Glasgow to the south end of the peninsula of Cantyre the distance is about 90 miles. The basin of the Clyde occupies 1500 square miles. Floods sometimes raise its waters 20 feet. Clydesdale, or the Valley of the Clyde, is noted for its coal and iron mines, orchards, and horses. Bell, in 1812, launched on the Clyde the first boat in Europe successfully propelled by steam. The Clyde forms the centre of the ship-building industry in Scotland. Consult Millar, *The Clyde from Its Source to the Sea* (London, 1888).

CLYDE, LORD. See **CAMPBELL**, SIR COLIN.

CLYDEBANK. A town in Dumbartonshire, Scotland, on the Clyde, 7 miles northwest of Glasgow (Map: Scotland, D 4). It has extensive yards for building iron and steel ships. Population (police burgh), in 1901, 18,654.

CLYDESDALE or **PAISLEY TERRIER**. See **TERRIER**.

CLYM (klīm) **OF THE CLOUGH**, κλυ'. See **CLIM**.

CLYMENE, κλυ'ē-nē. (1) The daughter of Oceanus and Tethys, and mother, by Japetus, of Atlas, Prometheus, and Epimetheus. (2) The mother of Phaëthon.

CLYMENIA (Neo-Lat. nom. pl., from Lat. *Clymene*, Gk. Κλυμένη, *Klymenē*, name of a nymph, originally p.p. of κλυειν, *klyein*, to hear). A genus of goniatitoid cephalopods, found in the Upper Devonian rocks of Europe and North America, and distinguished from the other goniat-

tites by the dorsal position of its siphuncle. The shell of this genus is a flattened spiral, the whorls of which are closely coiled so that each whorl clasps the outer half of that next inside it. The suture-lines are simply curved or lobed. In some beds of the European Upper Devonian the shells of this genus are so abundant as to give the name 'Clymenienkalk' to the limestone containing them. Consult Foord and Crick, *Catalogue of the Fossil Cephalopoda in the British Museum of Natural History*, part iii., pp. 14-32 (London, 1897). See also GONIATITES; CEPHALOPODA; DEVONIAN SYSTEM.

CLYMER, klī'mēr, GEORGE (1739-1813). An American patriot, one of the signers of the Declaration of Independence and a prominent member of the Constitutional Convention of 1787. He was born in Philadelphia, was orphaned when only one year old, was educated at the College of Philadelphia (now the University of Pennsylvania), and became a merchant in his native city. In 1772 he was appointed by Governor Penn to the position of 'Justice of the Court of General Quarter Sessions of the Peace, and of the County Court of Common Pleas of Philadelphia.' On the approach of the Revolutionary War, he became an active member of the patriot party, and was chosen successively a member of the Committee of Correspondence (1774) and of the Provincial Congress of Pennsylvania (1775). From July, 1775, to August, 1776, he served as one of the two treasurers of the Continental Congress; from October, 1775, to July, 1776, he was a leading member of the Pennsylvania Committee of Safety; and in July, 1776, he was one of the five men who were appointed by the Pennsylvania Legislature in place of the Pennsylvania delegates who had opposed the Declaration of Independence, which document he signed on August 2. He was a prominent member of the Constitutional Conventions of Pennsylvania in 1776 and 1779; served as captain under Cadwalader at the battle of Princeton; was a member of the Pennsylvania Assembly in 1777 and 1778; was reelected to the Continental Congress in March of 1778; was sent to Valley Forge by Congress as a special commissioner to inquire into the alleged maladministration of the Commissary Department; and in 1778 was one of the special commissioners sent by Congress to treat with the Indians at Fort Pitt (Pittsburg). In May, 1780, he co-operated with Robert Morris and others in founding the Bank of Pennsylvania to facilitate the furnishing of supplies to the army, and in both 1780 and 1781 he was reelected to the Continental Congress, by which in 1782 he, with Edward Rutledge, was sent as special commissioner to the Southern States, to secure the payment of funds due to the national treasury. From 1782 to 1785 he lived at Princeton, N. J., but returned to Philadelphia in the latter year and from then until 1789 was an influential member of the Pennsylvania Assembly. He took a prominent part in the Constitutional Convention of 1787; was a member of Congress from 1789 to 1791; was appointed by Washington in 1789 Supervisor of the Internal Revenue for Pennsylvania, in which capacity he was charged with the collection of the tax on spirits which brought on the Whisky Insurrection (q.v.); and in 1796 was one of the special commissioners appointed by Washington to treat with the Creeks and

Cherokees in Georgia. Subsequently, though taking no further part in public life, he took an active interest in public enterprises of various kinds, devoted much of his time to reading and study, and was president of the Philadelphia Bank and of the Academy of Fine Arts. He was one of the foremost leaders during the Revolutionary period, and had a wide reputation for ability, learning, and patriotism. Consult Dickenson, in the *Magazine of American History*, vol. v. (New York, 1880).

CLYSTER, klis'tēr (Lat., from Gk. κλυστήρ, *klystēr*, a syringe, from κλύζειν, *klyzein*, to purify). An old term for a medicine administered in the liquid form by the rectum, or lower end of the intestines. See ENEMA.

CLYTEMNES'TRA (Lat., from Gk. Κλυταμένηστρα, *Klytainmēstra*). In Greek legend, the daughter of King Tyndareus and Leda, and the twin sister of Helene. She became the wife of Agamemnon (q.v.), and bore him a son, Orestes, and three daughters, Iphigenia, Electra, and Chrysothemis. During the absence of Agamemnon on his expedition to Troy she formed an adulterous connection with Ægisthus (q.v.), murdered her husband on his return, and reigned for seven years with Ægisthus, till she was murdered by her own son, Orestes.

CLYTIE, klish'tī-ē (Lat., from Gk. Κλυτιή, *Klytiē*). A Greek maiden beloved by Helios (the sun). When he deserted her for Leucothea, she betrayed the latter to her father, who put her to death. As her lover did not return, she gazed after him, until in pity the gods changed her to a flower, called by the Greeks ἡλιοτρόπιον, *heliotropion*, of the same family as our heliotrope. The so-called Clytie of the British Museum is only the portrait of a Roman maiden.

CNIDUS, nī'dūs, or GNIDOS (Lat., from Gk. Κνίδος, *Knidos*). An ancient city on the western extremity of the promontory of Triopion (now Cape Krio), in Caria, Asia Minor, founded as a colony from the east coast of the Peloponnesus, hence said to be both Laconian and Argolic, and one of the six cities of the Dorian League. Cnidus (according to Strabo) had two ports, one of which was a closed harbor for war vessels. The original settlement was on an island, but the city later spread to the mainland, and a mole was built to unite the two parts. The southern port was formed by two moles carried into the sea to the depth of nearly 100 feet, one of which is nearly perfect at the present day. The city was famous for its worship of Aphrodite, and in one of its temples was the famous nude statue of the goddess by Praxiteles. The Cnidians valued this work so highly that they are said to have refused the offer of Nicomedes of Bithynia to pay their large public debt in exchange for this statue. Off Cnidus, the Athenian admiral Conon defeated the Spartan fleet in B.C. 394, and thus broke the power of Sparta in Asia Minor. The site is still covered with ruins, and in 1857-58 Sir Charles T. Newton excavated the sacred precinct of Demeter, discovering the fine seated statue of the goddess now in the British Museum. Consult: Newton, *Discoveries at Halicarnassus, Cnidus, and Branchidæ* (London, 1862-63), and *Travels and Discoveries in the Levant* (London, 1865).

CNOSUS, *nō'sūs*, or **GNOSUS** (Lat., from Gk. *Κνωσός*, *Knōsos*, or less correctly *Κνωσός*, *Knōssos*). An ancient city of Crete, on the north side of the island, 3 miles from the coast, near the modern Candia (q.v.), famous in legend as the home of King Minos (q.v.). The Diætanæ cave in the neighborhood was a legendary birth-place of Zeus, though in later times somewhat supplanted by the Iðæan cave on Mount Ida as a seat of worship. Here also legend placed the famous labyrinth (q.v.), in which the Minotaur was confined. In later times Cnosus was inhabited by Dorians, and shared with Gortyna the chief power in the island. Of late the site has become important from the excavations made by A. J. Evans during 1899-1900 and the following years. These have shown that the site of the early town was abandoned near the end of the Mycænean period, never to be reinhabited. A village of the Mycænean period has been discovered, and also a palace of far greater size and splendor than any yet known, bearing witness to the great power of the rulers of Cnosus in the heroic age. The decorations include wall-paintings on stucco, and reliefs of an artistic merit hitherto unsuspected in so remote a period (about B.C. 1500-1200) outside of Egypt. The art, however, is not Egyptian, but must be attributed to the pre-Dorian civilization of Greece. In the palace were also found a great number of clay tablets bearing inscriptions in two varieties of writing, neither of which can be read, though it seems clear that some of the tablets contain inventories of chariots, shields, and other stores. See **ARCHÆOLOGY**; **MYCÆNEAN AGE**.

COACH (Fr. *coche*, Ger. *Kutsche*, probably from Hung. *koesi*, coach, named after a little place called Koes (pronounced Koch) in western Hungary). A heavy inclosed four-wheeled carriage for the conveyance of passengers. The construction of the coach differs from that of other inclosed vehicles in the following particulars: (1) The roof forms a part of the framing of the body, and in this respect the construction is different from other covered carriages in which the roof is simply a canopy supported by iron rods or wooden pillars. (2) Coaches from the earliest times were suspended on springs. The coach sent by Ladislas, King of Hungary, to Charles VII. of France, is described as a carriage the body of which 'trembled.' (3) A coach is always designed with more than one seat for passengers.

According to Thripp (see Bibliography below), coaches were first made in the town of Koes, Hungary, and were so called from the name of the town, just as landaus and berlins are named from the towns which produced them. The same author traces their development from the huge agricultural wagons used on the Continent in the twelfth and thirteenth centuries, which were so constructed that, by different adjustment, they could carry a long timber, a cask of wine, a load of hay, or a family. The coaches of the Middle Ages were very elaborate affairs, used only by royalty and nobility, and for purposes of state. As late as 1550 there were only three coaches in Paris; one of these belonged to the Queen, another to Diana of Poitiers, and a third to a nobleman who was too corpulent to ride a horse. In 1631 a 'glass coach,' that is, a coach with glass windows, was built for the Infanta of Spain.

The first coach ever seen in England was made

in 1555 by Walter Rippon for the Earl of Rutland; in 1564 the same builder made a showy vehicle for Queen Elizabeth. Later in her reign the royal coaches were constructed with sliding panels, so that the Queen could show herself to her subjects whenever she desired.

STATE COACHES. The Romans during the Empire had a system of public vehicles for hire which traveled over definite routes and probably at stated times. During the Middle Ages no such system of public conveyance prevailed. Toward the end of the sixteenth century wagons began to travel regularly between the principal towns of England to carry goods and people. These wagons were called stages. They were soon superseded by coaches. In 1662 we find a writer condemning this innovation because "these coaches make country gentlemen come to London on small occasion, which otherwise they would not do but on urgent necessity; nay, the convenience of the passage makes their wives often come up, who, rather than make such long journeys on horseback, would stay at home. Here, when they come to town, they must be in the fashion, get fine clothes, and by this means get such a habit of idleness and love of pleasure that they are uneasy ever after." In spite of such protests coaches became more and more popular, and by 1750 an elaborate system of routes had been established. In 1784 these coaches began to carry the mail. The flourishing period of the stage-coach was at the opening of the nineteenth century. About this time an extensive good-roads movement had been inspired by the systems of Macadam and Telford. The stage-coaches acquired a speed of ten miles an hour on the most important English routes. In America stage routes, although established between some of the principal cities, were never developed to the extent to which they were in England. The introduction of transportation by steam proved a speedy and successful rival. This form of carriage—the railway-car—has been given the name of coach, and, indeed, the early passenger-cars were modeled in shape after the coaches. For further history, see **COACHING**.

At the beginning of the twentieth century coaches are built both for public and private use, and in design they are closely akin to those in use in England during pre-railroad days. They may be described as consisting of two parts—the *carriage* and the *body*. The former comprises the axles, perch (or reach), futehells, and transom (or bed), and many minor component parts, which together with the wheels form a complete vehicle or carriage upon which the body part is supported by the springs. The latter are secured to the bed and body by clips, and are always made of several stiff plates, because of their greater elasticity as compared with one plate of steel of the same length. The pole fits between the inside futehells, and completes the carriage part. In the best-made carriages the dimensions of a pole are: $3\frac{1}{2}$ inches wide, and $4\frac{1}{4}$ deep, measured at a point 2 feet from the splinter-bar. For horses averaging between 15 and 16 hands, the length of the pole is usually 9 feet from the front of the splinter-bar to the cross-head or the pole-head; for smaller horses, cobs, etc., about 3 inches shorter. The *body* is practically the same in all coaches, and is usually 4 feet 10 inches in length, 4 feet wide, and 4 feet 2 inches high. It is built as lightly as pos-

sible, so as not to detract from the centre of gravity of the coach. The roof is almost flat, in order that seats may be built on it, or for baggage, and the sides have a 'cant' in a horizontal direction, and the 'turn under' in a vertical direction. There are two *boots*, the one in front being a few inches higher on the body than the hind boot, which latter is about two feet long (the front one three feet), and two feet deep. Both these boots are a little narrower than the body. The *box* and *driving seat* are placed on the front part of the front boot, and are supported by solid ends or risers. The shape of the seat is made by the cushion, and not by the seat itself, which is always flat. All modern coaches have brakes, but a good driver rarely has recourse to them, except in emergencies. (See *DRIVING*.) A complete set of tools is carried in case of accidents to horses or vehicle. The weight of a road coach varies from 2200 to 2600 pounds. Builders generally contrive to throw more of the whole weight into the carriage part, in order to keep the centre of gravity low, and because it has to withstand the bulk of the strains. The cost of a coach depends very largely upon its finish and the country in which it is built. Approximately, average prices are: in America, \$2400; England, 300 guineas; and France, 8000 francs.

The typical American coach is the Concord coach, so called from Concord, N. H., where many of them are built. Its principal constructive features are three parallel straight perches connecting the hind axle with the front transom bed, which steady a very rigid, rectangular frame. At each of the four corners of this frame are placed stiff iron standards carrying at their upper ends square iron shackles. Connecting with these shackles are strong leather straps, upon which rests the body of the coach, a mode of suspension common to European carriages before the use of springs. These latter are entirely absent in the Concord coach. The so-called *Hackney coach* is a smaller four-wheeled vehicle for hire. Consult: Adams, *English Pleasure Carriages* (London, 1837); Thrupp, *History of the Art of Coach-building* (London, 1877). See *CARRIAGES*; *COACHING*.

COACH-DOG, or **DALMATIAN CARRIAGE-DOG**. A dog of medium size, related to the hounds (q.v.), and having the form and smooth coat of a pointer, which properly is used only to follow a carriage, as an ornamental part of the equipage, and as a watch-dog about the stable. This dog should, therefore, be capable of endurance on foot, trim of form, well groomed, and 'stylish' in appearance. The coat must be pure white, evenly spotted with small, round, *distinct* spots, from half an inch to an inch in diameter, either perfectly black or pure brown. The head should be long, fine, and like that of a pointer, but not so deep. This dog is commonly said to have been first bred in Dalmatia, but the same breed seems to have been common in Spain as far back, at least, as the sixteenth century. It is often used in Denmark to draw carts. See *Dog*.

COACH-HORN. A straight tapering horn made of brass or copper, and used to sound certain simple calls. There are no keys and the range is limited to the six open notes (c^1 - g^1 - c^2 - e^2 - g^2 - c^3), of which the high c is exceedingly

difficult. The coach-horn varies considerably in length, a short (42-inch) horn giving more brilliant notes, and a long (56-inch) horn giving a softer, richer tone. The various calls sounded with the coach-horn have a well-recognized place in coaching; and in addition to those used universally, as in the case of the examples noted below, there are others employed by particular coaches and routes. A few of the best-known calls are as follows:

Get Ready.

The Start.



Clear the Road.



Off Side.

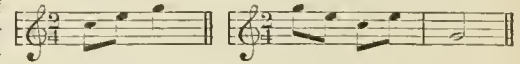


Near Side.



To the Right.

To the Left.



Change Horses.



COACHING. Driving or being driven in a coach (q.v.) drawn by four or more horses. The driving of a coach requires great skill, coolness, judgment, and a knowledge of horses on the part of the driver; and, where indulged in as a sport or pastime, may be said to derive its greatest attraction from that fact alone. The history of coaching is naturally part of the history of the coach, for which see article *COACH*. The first stage in England was put on the road in 1659 and traveled between London and Coventry. At the beginning of the eighteenth century there were many coaches employed throughout the country; but the slowness of travel was such that it took a week to go from London to York, and proportionately for all lesser distances. The royal mail, which had been carried by a system of post-boys under a contract speed of five miles an hour, was, in 1784, undertaken by Palmer's mail-coach service, which carried mail as well as passengers, and grew to such a success that the average speed-rate of mail coaches was brought up to 10 miles an hour. This, however, was due almost entirely to the improvements in road construction instituted by Macadam and Telford.

In 1836 coaching had become so important an institution that 54 coaches were employed in England, 30 in Ireland, and 10 in Scotland. The British Government exercised a rigid supervision

and discipline over the stage-coach service, because of its connection with the post-office system, and exacted a military punctuality and regularity in its running and general management. The landed and country gentry, generally, maintained a zealous watchfulness over the condition of the roads, and consequently much competition was indulged in by the people of the countryside, to attract coaches to some particular route, and among the coaches themselves, to establish the best records. The drivers were frequently gentlemen, and often members of the aristocracy. The 'Brighton Age,' in its palmy days, numbered among its professional drivers Charles Jones, Sir Saint Vincent Cotton, Dick Brackenbury, and many others; while such distinguished men as the Duke of Beaufort, Lord Chesterfield, and Prince Henry Battlyányi were among the amateur drivers of that and similar coaches. Professional drivers would frequently receive as much as \$3000 and \$4000 per year for their services; an immense salary for those days, and the best indication of the importance attached to the position. After 1840 coaching as a public necessity ceased to be; and with diminishing business, decay set in rapidly.

In America, even in Colonial times, four-horse stage-wagons were in regular employment throughout the country, the most important (1760) plying between Philadelphia and New York. Owing to the absence of regular roads, the saddle-horse was the favorite means of transport. Coaching as a recreation or amusement began in England about 1868—a revival which spread to America as well as throughout Continental Europe. In England it had as its leading supporters men who remembered the pre-railroad coaching days, and desired to save the institution from the oblivion which threatened it. A more or less successful effort had been made to keep alive the old spirit of coaching on one or two of the older routes; but at the time of the so-called revival, the Four-in-Hand Club, established in 1856, and Sir Henry Peyton, were the only interested ones. The results were not very permanent so far as England was concerned; for in 1880 there were only four coaches running—a state of things, however, which has since considerably improved.

In 1877 the 'Old Times' was again put on the road between London and Saint Albans; the Four-in-Hand and the Coaching Clubs afterwards became permanent organizations, and their 'meets' have come to be regarded as among the social events of the London season. The first English coaching club was the B. D. C., or Bensington Driving Club, limited originally to sixteen members, and first organized in 1807. In 1823 the annual club meets were abandoned, and in 1856 the club ceased to exist. The Four-Horse Club, frequently but inaccurately referred to as the Four-in-Hand Club, was formed in 1808, and, after a varied career, disbanded in 1830. Amateur coaching in the United States may be said to have antedated the English revival by two or three years. Mr. August Belmont putting the first coach on the road in 1864. Mr. Leonard Jerome is credited with the distinction of driving the first American-built coach, and he, together with a number of other gentlemen, founded in 1875 the New York Coaching Club. Since then coaching has been a regular feature of fashionable New York and Newport

life, the number and equipment of the coaches employed comparing most favorably with those of either London or Paris. Indeed, modern coaching in both England and France has received no little impetus from American lovers of the pastime.

At the present day coaching is confined almost exclusively to such great centres and cities of the world as are most frequented by the wealthy and leisure classes, as London, New York, Paris, Berlin, Vienna, etc., and is generally employed in connection with racing and other recreational meetings. The following is a list of the principal road coaches of New York, London, and Paris, past and present, together with their routes and time taken. *New York*: Brunswick Hotel to Pelham Bridge, 15.5 miles in 1½ hours; Brunswick Hotel to Yonkers, 18 miles in 1¾ hours; Holland House to Ardsley Casino, 25.8 miles in 2½ hours. *London*: Northumberland Avenue to Box Hill, 25 miles in 3 hours; Northumberland Avenue to Virginia Water, 26.5 miles in 3¼ hours; Northumberland Avenue to Windsor, 30 miles in 4 hours. *Paris*: New York Herald Office to Cernay-la-Ville, 29 miles in 3 hours; New York Herald Office to Pontoise, 26.3 miles in 2¾ hours; New York Herald Office to Maisons LaFite, 19.4 miles in 2 hours; New York Herald Office to Versailles, 14.5 miles in 1¾ hours. Of the 'two-day' trips, or routes which require an entire day each way, the most important in the United States is that from the Plaza Hotel, New York, to Tuxedo Park, 47.5 miles, which is covered in 7½ hours. In England, the journey from the White Horse Cellar, Piccadilly, to Brighton (54 miles) is accomplished in 6 hours; while in France the distance from the New York Herald Office, Paris, to Fontainebleau (60 miles) is accomplished in 7 hours. *Stages*: Under the best conditions a change of horses would be made every seven miles, but ordinarily it has to be done to suit the available stabling accommodations of the route. The best authorities agree that a fast coach, running out and in, is best served by having a horse to each mile of the road. Thus 30 horses would be necessary to run a coach out and in once a day, between points 30 miles apart. An illustration of the distance between stages under normal conditions, over a route 28 miles long, would be as follows: First stage 7, second stage 8, third stage 7, fourth stage 6 miles, each team serving one stage each way. On hilly roads longer stages are frequently made, but at a greatly reduced rate of progress. It is common experience that 'pace' rather than 'pull' is responsible for the disablement of the average coach-horse. The bibliography of coaching is somewhat limited, but the following works are both interesting and comprehensive: Nimrod (C. J. Apperley). *Essays on the Road* (London, 1876); the Duke of Beaufort, *Driving* (London, 1887); Rogers, *A Manual of Coaching* (Philadelphia, 1909).

COACH-WHIP SNAKE. See WHIP-SNAKE.

COAGULATION (Lat. *coagulatio*, from *coagulare*, to curdle, from *coagulum*, rennet, from *co-*, together + *agere*, to drive). The amorphous solidification of a liquid, or part of a liquid, as when the casein of milk is solidified by rennet in making cheese (q.v.), or the white of an egg by boiling. The process varies in various substances. Albumen, or the white of an egg, co-

agulates at a temperature of 160°. Milk is coagulated or curdled by the action of rennet or by acids. The fibrin in the blood, chyle, and lymph of animals is coagulated after the separation of these fluids from the living body.

COAHUILA, kō'ā-wē'lā (named from the Mexican tribe *Coahuiltees*). A northern State of Mexico, separated from Texas on the north and east by the Rio Grande, and covering an area of 63,570 square miles (Map: Mexico, H 4). With the exception of the eastern part, which is somewhat mountainous, the surface forms an elevated plateau, with a general incline toward the Rio Grande. The western part is taken up by the Bolson de Mapimi, a semi-desert region, only partially explored, with many lagoons and vast mineral resources. The climate is moderate and healthful. The chief occupation is cattle-raising, although the soil is well adapted for the growing of cereals and European vegetables, to which more and more attention is being paid. In the southwest some vines and cotton are cultivated. The State is traversed from north

types being connected by all degrees of intermediate stages. In Carboniferous times certain regions were covered by rank and luxuriant vegetation which grew upon swampy land slightly raised above the level of the sea. As the plants died, their remains fell into the water of the swamp, and slowly formed an accumulation of vegetable matter of increasing thickness. By slow subsidence this thick layer of vegetable matter sank below the water, and became gradually covered by sand, mud, or other mineral sediments, washed out from the shore. Successive elevations and depressions, with intervening accumulations, may thus have yielded successive beds. Subsequent elevation, folding of the earth's crust, and accompanying metamorphism, followed by erosion of the surface, has exposed to view the edges of the once deeply buried beds of coal.

COMPOSITION. The following analyses of peat, lignite or brown coal, and true coal indicate the changes which vegetable matter undergoes by decay and pressure:

ULTIMATE ANALYSES OF PEAT AND COALS

COMPONENTS	PEAT	LIGNITE		BITUMINOUS COAL		ANTHRACITE	
		Carbon, Wyo.	Robertson Co., Texas.	Whiteside, Tenn.	Brazil, Ind.	Spring Mt., Pa.	Crested Butte, Colo.
	%	%	%	%	%	%	%
Water.....	20.00	7.35	16.40	1.04	5.45	1.97	0.72
Carbon.....	47.20	63.65	54.46	78.83	76.05	91.40	82.50
Hydrogen.....	4.90	4.60	4.41	5.51	6.88	2.59	5.15
Oxygen.....	22.90	19.44	16.07	4.00	8.13	0.08	4.66
Nitrogen.....		1.40		1.12	1.37	0.21	1.12
Sulphur.....		0.76	0.96	2.61	0.80	0.71	0.85
Ash.....	5.00	2.80	7.70	6.89	2.32	3.04	6.04

to south by the Mexican International Railway. Population, in 1900, 280,899; capital, Saltillo (q.v.).

COAITA, kō-āi'tā. See SPIDER-MONKEY.

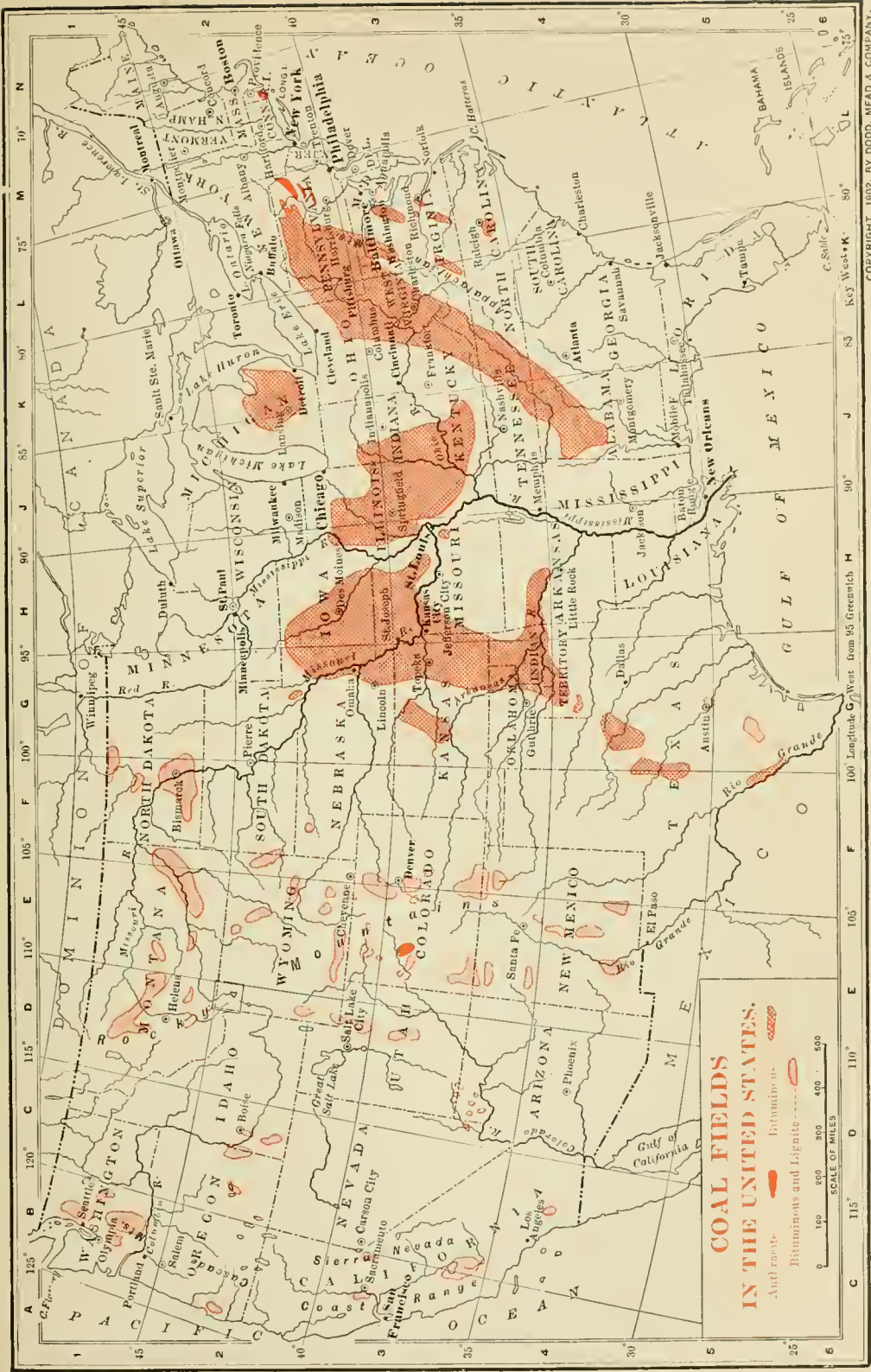
COAL (AS. *col*, OHG. *kolo*, Ger. *Kohle*; ultimately connected with Skt. *jval*, to blaze, and probably with Ir., Gael. *qual*, coal). A mineral fuel of solid character, found and used in many countries. The name is a word common to all the languages of the Gothic stock, and seems allied to the Latin *calere*, to be hot; as also 'to glow,' and 'kiln.' The word 'coal' has often prefixed to it some qualifying word, to distinguish different kinds of coal; such as cannel coal, stone coal, pea coal, etc.

ORIGIN. Coal is one of the most important economic minerals, and is of vegetable origin. When vegetable matter accumulates under water it undergoes a slow process of decomposition, gradually giving off its nitrogen, hydrogen, oxygen, and some carbon, the result of which if carried far enough is the formation of a mass of carbon. Peat (q.v.), the material so often found underlying swampy tracts in north temperate zones, represents the first stage in the coal-forming process, and the further stages are obtained by the burial of these vegetable deposits under great loads of sediment, where they become subjected to pressure, and at times to heat also. This effects a series of changes, especially consolidation and loss of oxygen, and gives a series of products, whose nature depends on the degree to which the original vegetable matter has been changed. The products are known as *lignite*, *bituminous coal*, and *anthracite coal*; these three

These analyses bring out well the general relations of the different elements, and the increase in carbon toward the anthracite end of the series; still they give but little information concerning the commercial value of the coal. The usual custom in making a commercial analysis is to determine the form in which these elements occur—that is, the amount of water, volatile hydrocarbon, fixed carbon, sulphur, and ash. This proximate analysis is also used as the basis of classification of coals. Thus:

COMPONENTS	Peat	Lignite	Bituminous coal	Anthracite
	%	%	%	%
Moisture.....	78.89	13.29	1.30	2.94
Volatile hydrocarbons.....	13.84	59.86	20.87	4.29
Fixed carbon.....	6.49	18.52	67.20	88.18
Ash.....	0.78	8.32	8.80	4.04
Sulphur.....	.....	2.36	1.83	0.65

A proximate analysis like the above is of practical value, since it gives us a better conception of the coal worth. Thus the freedom of burning increases with the amount of volatile hydrocarbons, while the heating power depends on the amount of fixed carbon present. Sulphur is an injurious constituent when the coal is to be used in the manufacture of gas or for metallurgical purposes; while ash is undesirable, since it displaces so much carbon, and if it contains fusible impurities such as iron, lime, or alkalis, it causes clinkering. Moisture retards the heating power of the coal until it is driven off. Since



**COAL FIELDS
IN THE UNITED STATES.**

Auth. route ——— Bituminous —·····
 Bituminous and Lignite —····· Anthracite —·····



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the heating power of coal is its most important property, this is often tested by means of an apparatus known as a 'calorimeter.' (See CALORIMETRY.) The principle of the test depends on the determination of the weight of water which can be converted into steam at 212° F. under atmospheric pressure with one pound of coal. (See also HEAT.) In addition to the varieties of coal given above, there may be mentioned *semi-bituminous coal* and *cannel coal*. The properties of the different varieties are as follows:

Anthracite contains 84 per cent. or more of fixed carbon, and also little ash, sulphur, and moisture. It has great heating power, and burns with a smokeless flame. Owing to its comparative scarcity, it commands a higher price than the bituminous. Anthracite is dense, has a shining lustre, and usually breaks with a smooth conchoidal fracture. It is estimated by some geologists that about ten inches of peat is required to make one inch of anthracite coal. In the United States anthracite coal is confined chiefly to the eastern edge of the Appalachians in Pennsylvania, where the folding of the rocks has been very intense, and where the coal-seams have been subjected to great pressure. It is also known in Colorado, near Crested Butte, where the bituminous coals have been locally changed to anthracite by the heat of basalt intrusions. It is mined extensively in England, and large quantities are known in China.

Bituminous Coal contains 50 to 75 per cent. of fixed carbon, and 25 to 30 per cent. volatile hydrocarbons. It burns with a rather long and smoky flame, and is also much used for steaming purposes. Many bituminous coals have the property of coking or caking (see COKE) when heated to redness. Most of the Carboniferous and many of the Mesozoic coals of the United States are bituminous.

Semi-Bituminous Coal resembles bituminous coal in appearance, but is intermediate between it and anthracite. It contains from 70 to 84 per cent. of fixed carbon, and is considered of superior value for steaming purposes. This variety is obtained from Pennsylvania, Maryland, and West Virginia.

Cannel Coal is a variety of coal very rich in volatile hydrocarbons, and found sparingly in parts of Kentucky, Ohio, and Indiana. Its chief use is as a gas-enricher, since it yields 8000 to 15,000 cubic feet of gas per ton. Cannel coal is so called because it burns with a bright flame like a candle, and the name parrot coal was given to it in Scotland, from the crackling or chattering noise it makes while burning. It is very compact in texture and may even have an oily look; certain forms found in England admit of being polished, and ornamental articles have been made from them and sold under the name of jet.

Lignite, or Brown Coal, is a partially formed coal, containing much moisture and volatile matter. It often shows the woody structure of peat and burns very easily, but gives off little heat.

HISTORY AND USE. The value of coal does not seem to have been known to the ancients, nor is it well known at what time it began to be used for fuel. Some say that it was used by the ancient Britons; at all events, it was an article of household consumption to some extent during the Anglo-Saxon period as early as A.D. 852. There seems to be reason for thinking that Eng-

land was the first European country in which coal was used in any considerable quantities. In America the deposits near Richmond, Va., were discovered in 1701, and mining was begun in 1750, while anthracite was first produced in 1793. Extended coal-mining in the United States did not really begin, however, until about 1820. Since that time up to the present, the increase has been about 3500 per cent. In 1822 the amount of coal mined in Virginia was about 48,000 long tons. Now the production for the United States is about 270,000,000 short tons, or greater than that of any other country of the world.

Coal is used largely for domestic purposes, either as fuel or, in the form of gas, for illumination. Its use for the latter purpose is, however, not so widespread as formerly, water-gas having superseded it to a considerable extent. In the production of steam for motive power it also finds important applications. It is furthermore widely employed in the metallurgical industry in the form of either coal or coke, and in this connection may serve both as a fuel and as a reducing agent. Coke (q.v.) is made only from bituminous coal. Lignite seldom has much value as a fuel, owing to the large percentage of moisture that it contains. Because of this moisture it tends to crack in drying, and must therefore be used soon after mining, and in localities where it does not require long transportation from mine to market. This is true, for instance, of some of the lignite deposits in Colorado which are near the Denver market, and therefore possess commercial value. Lignite has sometimes been successfully used in the manufacture of producer gas, and indeed even peat has been found adaptable for this purpose.

COAL AREAS. The leading coal-producing countries of the present day are the United States, Great Britain, Germany, France, Belgium, Austria-Hungary, and Russia. The Russian coal-fields are probably the most extensive in Europe. In the Far East coal is known in India, the Malay Archipelago, Japan, and China. The coal-fields of the last-named country are probably the greatest in the world, and may become a source of European supply. Up to the present time they have not been developed in a systematic manner. Italy, Spain, Sweden, Australia, New Zealand, Borneo, the Philippine Islands, and many countries in Africa also produce coal; while in America deposits are worked in Canada, Mexico, Chile, and Argentina, and are known to occur in Colombia and Peru.

UNITED STATES. The coal-fields of the United States are especially extensive; indeed, in some instances the deposits of a single State exceed those of Germany or France in area. They are separable into several regions, the divisions being geographical and not geological. The geological ages of the coals in 1, 2, 3, 4, and 6 (table on next page) are all Carboniferous, except small Triassic areas in Virginia and North Carolina. Those of 5 are Cretaceous and Tertiary.

By far the most important of these regions is the Appalachian, which takes in portions of Pennsylvania, Ohio, West Virginia, Virginia, Maryland, Eastern Kentucky, Eastern Tennessee, Georgia, North Carolina, and Alabama. It is about 750 miles long, and 70 to 80 miles wide. The coals are all bituminous or semi-bituminous with the exception of those at the northeastern end, in Pennsylvania, where close folding of the rocks

has changed the bituminous into anthracite coal. In general, the rocks at the upper or northern end of the Appalachian belt are folded, while

among three districts—the Warrior, Cahawba, and Coosa, named after the rivers that drain them. The anthracite district of Pennsylvania occupies an area of about 470 square miles on the left bank of the Susquehanna. The strata between Pottsville and Wyoming, which belong to the lowest portion of the coal-measures, are probably about 3000 feet thick; but it is difficult to make an exact estimate, because of the numerous folds and contortions. There are from 10 to 12 seams, each over three feet in thickness. The principal one, known as the Mammoth or Baltimore vein, is 29 feet thick at Wilkesbarre, and in some places exceeds even 60 feet. Many of the Appalachian coals, notably those of western Pennsylvania, West Virginia, and Alabama, produce excellent coke. The Ohio coals do not yield good coke. In most of the other coal-fields of the country the coal-beds lie comparatively flat, and the basins are quite shallow.

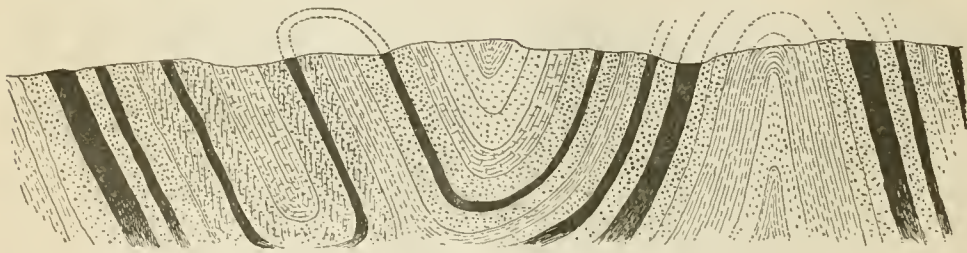
COAL FIELDS OF THE UNITED STATES

Region	State	Area
		<i>Square Miles</i>
1. Appalachian	Pennsylvania.....	10,700
	Ohio.....	10,000
	Maryland.....	550
	Kentucky.....	9,000
	West Virginia.....	16,000
	Virginia.....	365
	Tennessee.....	5,100
	North Carolina.....	2,700
	Georgia.....	200
	Alabama.....	8,660
Total.....		63,275
2. Northern.....	Michigan.....	6,700
3. Central.....	Kentucky.....	4,000
	Indiana.....	6,450
	Illinois.....	36,800
Total.....		47,250
4. Western Central	Missouri.....	26,700
	Iowa.....	18,000
	Nebraska.....	3,200
	Kansas.....	17,000
	Arkansas.....	9,100
	Indian Ter.....	20,000
	Texas.....	4,500
Total.....		98,500
5. Cordilleran.....	Colorado.....	Unknown
	New Mexico.....	"
	Utah.....	"
	Wyoming.....	"
	South Dakota.....	"
	North Dakota.....	"
	Montana.....	"
California.....	"	
	Oregon.....	"
	Washington.....	"
6. Rhode Island.....	Rhode Island.....	Small

The Michigan area is a small one in the lower peninsula of Michigan. It forms a circular basin with a diameter of about 50 miles. The coals are bituminous, non-coking, and are mined chiefly for local use. The seams range from a few inches to three feet in thickness.

The Central area includes parts of western Kentucky, Indiana, and Illinois, and lies chiefly within the latter State. These coals are all bituminous, of Carboniferous age, and are used chiefly for steaming. The thickness of the Carboniferous System varies from 1200 to 1400 feet in southern Illinois, to about 600 feet in Indiana, and the workable coal-seams vary in number from 7 to 12 in Illinois, and their thickness from three to eight feet. The 'block coal' of Indiana has quite a reputation. The Western Central area includes Iowa, Missouri, Arkansas, Indian Territory, Kansas, and part of Texas. Here again there is an abundance of hituminous coal, which has been developed chiefly in Iowa and Missouri, while Kansas is now coming into prominence. The coals of this area are chiefly adapted to smithing and steaming purposes, and, so far as tried, Kansas yields the only coking varieties.

those of the lower end, as in Alabama, are often faulted in addition, so that the coal-miner frequently finds the coal-seam suddenly broken off. The Carboniferous section of this region has



CROSS-SECTION OF ANTHRACITE COAL MEASURES (PENNSYLVANIA).

been described in the article CARBONIFEROUS SYSTEM, from which it may be seen that the coal-beds occupy more or less well-marked stratigraphic positions. The maximum thickness of strata is from 2500 to 3000 feet; the seams measuring 120 feet near Pottsville, 62 feet at Wilkesbarre, and 25 feet at Pittsburg, showing a gradual diminution in a westward direction. The most persistent coal deposit is the Pittsburg seam, which is known over an area measuring 225 by 100 miles, and has a thickness varying from 2 to 14 feet. In Alabama the deposits are distributed

The Cordilleran area comprises the coal regions of Colorado, New Mexico, Utah, Wyoming, South Dakota, North Dakota, Montana, California, Oregon, and Washington. In this field are found many varieties grading between lignite and anthracite. They are all of either Tertiary or Cretaceous age, and their discovery showed the incorrectness of the old classification, which included all post-Carboniferous coals under lignite. Colorado is perhaps the most important producer, having a number of good bituminous seams. Those in the vicinity of

COAL-MINING



1. THE OLD WAY—With hand pick.

2. THE MODERN WAY—With machine pick.

Crested Butte have been changed locally to anthracite by the metamorphic action of igneous intrusions. Excellent coking coals are found near Trinidad. The New Mexican coals are in part an extension of the Colorado veins, and bear a good reputation, as do also many of the Wyoming coals. California has little fuel of good quality, and has for many years drawn on Australia for its coal-supply, but in recent years the coals of Oregon, Washington, and British Columbia have become a source of supply.

The rocks of the small Rhode Island area have been so highly metamorphosed that the coal has been altered to graphitic anthracite. It is sold on the market as amorphous graphite, and has little value as a fuel.

CANADA. The Acadian field includes deposits in Nova Scotia and New Brunswick, the former being quite important. The coals are bituminous and of good quality. In the mountain ranges of British Columbia extensive coal-seams have been discovered, and they are now under development. A good quality of coke is made from the coal of Crow's Nest Pass, which finds a market at the British Columbian smelters. The most productive mines of the Pacific Coast are located on Vancouver Island, whence large shipments of bituminous coal are made to San Francisco and other ports in the Western United States.

SOUTH AMERICA. Coal, probably of Carboniferous age, is found in the Brazilian provinces of São Pedro, Rio Grande do Sul, Santa Catharina, also in the neighboring Republic of Uruguay. Very little development work has been done in the fields, and the output is inconsiderable. In Argentina and Chile, where Cretaceous coal occurs, there is more activity; but these countries still depend largely upon Great Britain for their supplies. In Peru both Cretaceous and Carboniferous deposits are found at various points in the interior, the former occupying a position on the first rise of the Andes, while the latter occurs in higher ground and at a greater distance from the coast.

UNITED KINGDOM. Next to the coal-fields of the United States, those of the United Kingdom are of the greatest economic importance. Within the limits of England, Scotland, and Wales there are more than twenty areas underlain by seams of anthracite, bituminous, and cannel coal. The largest of these areas is that of South Wales, in Monmouthshire and Pembrokeshire, which has a length of about 50 miles and a width of nearly 20 miles. The coal-measures form an elliptical basin, and are several thousand feet in thickness. Coal is found in three horizons, of which the upper has no less than 82 seams, measuring 180 feet in all. The lowest horizon yields valuable steam and blast-furnace coal. In the north of England the coal-fields of Lancashire, Derbyshire, and Yorkshire are the largest. The Lancashire field is of irregular quadrilateral form, with a width of about 18 miles from north to south, and a length from east to west of more than 50 miles. It includes about 100 feet of coal in workable seams, which dip at a high angle and are much broken by faulting. The Yorkshire and Derbyshire measures occupy a single area that extends for a distance of about 60 miles from Bradford on the north to near Derby on the south, and has a breadth of from 3 to 32 miles. They yield bituminous coal, excellent for steaming and iron-making purposes.

North of the Yorkshire field is the large basin of Northumberland and Durham, from which steaming, coking, and house coals are produced. In Scotland the coal-measures are extensively developed in Ayrshire, Lanarkshire, Stirlingshire, and Fifeshire. The productive coal-fields of the United Kingdom belong to the Carboniferous period; brown coal of Jurassic or Tertiary age is known to occur, but the seams are too small to be profitably exploited. The exports of coal from this country are of great importance, amounting in 1900 to 51,638,000 short tons, valued at \$193,032,000. Much of the coal goes to Italy, Russia, Holland, and to the European countries that possess small resources of the mineral, while the remainder is exported to the more remote parts of the world.

Further details regarding the distribution of coal will be found under the titles of countries.

OUTPUT. The world's annual production at the present time is about 850,000,000 short tons; the output in 1900, according to *The Mineral Industry*, was distributed as follows:

COUNTRY	SHORT TONS
United States.....	268,315,433
Great Britain.....	252,176,352
Germany.....	164,850,131
Austria-Hungary.....	43,020,049
France.....	36,673,945
Belgium.....	25,863,003
Russia.....	16,500,000
Canada.....	5,608,636
Japan.....	4,189,490
India.....	6,852,803
Spain.....	2,847,199
Sweden.....	278,132
Italy.....	528,989
Africa.....	546,563
New South Wales.....	6,168,337
New Zealand.....	1,225,603
Queensland.....	556,939
Victoria.....	237,052
Tasmania.....	56,822
Other Countries.....	2,755,750
Total.....	843,247,288

It is interesting to follow the progress of the United States as a coal-producer. In 1868 Great Britain produced 3.6 times as much coal as the United States, while Germany's product that year was 15 per cent. greater than that of the United States. In 1871 the United States exceeded Germany's output by about 10 per cent., but afterwards fell back to third place until in 1877 she once more sprang forward, and gained on both Germany and Great Britain. In 1899 the United States led the world, and supplied nearly 32 per cent. of its production.

The average price of bituminous coal at the mines in the United States, per short ton, varied between 1893 and 1900 from \$0.80 to \$1.04; while that of anthracite was between \$1.41 and \$1.59 for the same period. The total number of laborers employed during 1900 was 449,181, of which number 144,206 were anthracite miners.

During the closing years of the nineteenth century European countries have been confronted with a most serious problem—the exhaustion of their coal-supply. This condition was emphasized in 1899 and 1900 by the occurrence of strikes in the Wales coal regions, by war in South Africa, and by a stimulation of industries in Germany which required much additional coal. Prospecting having shown but little reserve material, the most natural result was to look to the United States, and in 1900 there began a movement of coal to Europe, which may

before many years assume large proportions. Ocean freights are the present great drawback.

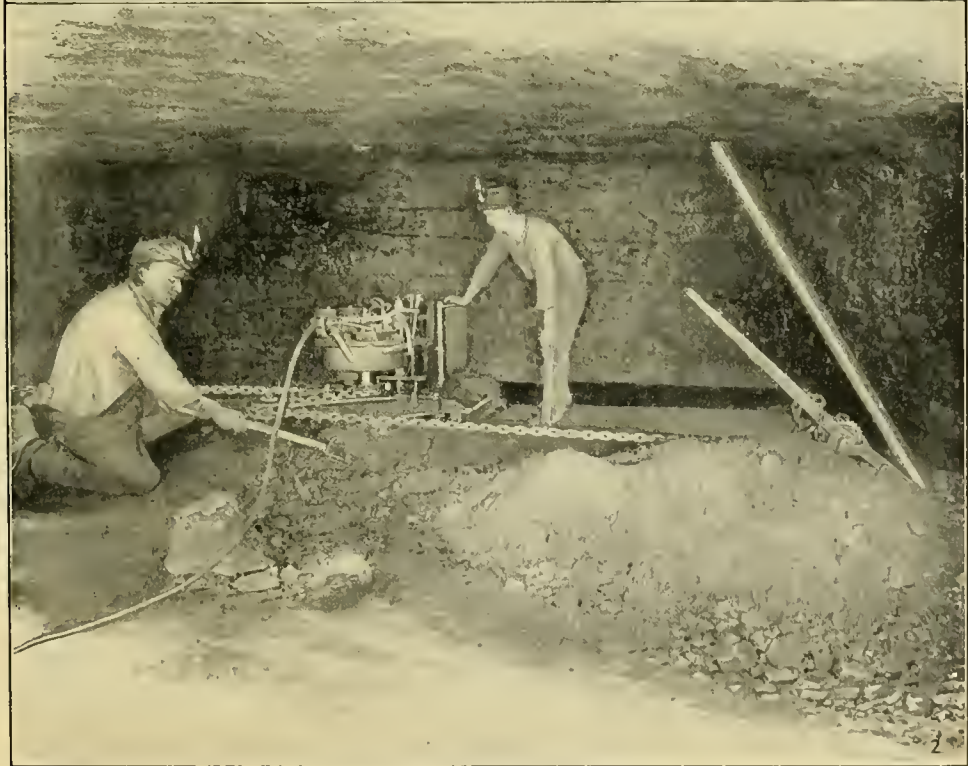
MINING OF COAL. The presence of coal in paying quantities having been determined by prospecting and geological surveys, the next consideration is to extract this coal from seams. No definite rules can be given for the selection of a method of mining that will cover all conditions; each mine furnishes a distinct and separate problem. Every system of mining, however, aims to extract the maximum amount of the deposit in the best marketable shape and at a minimum cost and danger. Speaking broadly, all methods of mining come under the head of either open working or closed working. Open working is employed when the deposits have no overburden of barren rock or earth, or where this overburden is of such small depth that it can be easily and cheaply removed, leaving the coal deposit exposed. The mining of such exposed seams of coal is really a process of excavation or quarrying, and the machines used in making open-pit excavations and in quarrying are applicable to the work. Closed working is adopted when the depth of the overburden is so great that the mining must be conducted underground. The first task in opening up underground coal-seams is to secure access to the seam by means of shafts, slopes, or tunnels. Shafts are vertical openings from the ground surface to the coal-seams. In the United States shafts are usually made square or rectangular in form. This practice is largely due to the fact that timber is used for lining shafts. In Europe round or oval shafts are frequently employed with linings of brick, iron, or masonry.

Generally the shafts are divided into two or more compartments, in each of which is installed an elevator for hoisting the coal-cars to the surface. The number of compartments in a shaft and their arrangements depend upon the particular use to which the shaft is to be put, the number of shafts employed, and their depths. Where the seams are comparatively near the surface, it is usually cheaper to sink a number of two or three compartment shafts than it is to haul all the ore to one large shaft; while, when the shafts are very deep, it is preferable to sink a smaller number of four or six compartment shafts and extend the underground haulage to a single shaft over a great area of the workings. Where timber lining is employed, a stronger construction is obtained by placing the compartments side by side in a long, narrow shaft than by grouping them in a square shaft. In shallow mines separate shafts are often employed for hoisting and for pumping, ventilation and ladder-ways. One of the largest coal-mine shafts in America is situated at Wilkesbarre, Pa.; it is 1039 feet deep, 12 × 52 feet in size, and has five compartments. The methods of sinking mine shafts are essentially the same as those used in sinking shafts for tunnels. (See TUNNEL.) Slopes are openings begun at the outcrop of an inclined seam, which they follow down into the earth. Slopes are usually made with three compartments side by side, two of which are used as hoistways and the third for the traveling-way, piping, etc. When the dip of the slope is under 40 degrees the slope is made about seven feet high, but when the dip exceeds 40 degrees cages have to be used and a great height is necessary. Slopes are usually

lined with timber. Tunnels are nearly horizontal passageways beginning on the side of a hill or mountain and extending into the earth until they meet the coal-seam; they are built for both haulage and drainage purposes, and are constructed like railway tunnels, except that the cross-section is usually much smaller, and that it is lined with timber instead of with permanent masonry. The forms of timbering used in coal-mining are various, and are of interest chiefly to the practical miner; special treatises should be consulted by those interested in the details. In a general way, it may be said that timber used for underground support in mines should be of a light and elastic variety of wood. Oak, beech, and similar woods are heavy and have great strength, but when they do break it is suddenly and without warning, thus bringing disaster to the miners who might escape if a tough wood were employed which gives warning of rupture by bending and cracking. It is a very common practice to employ preserved timber in mining work. See FORESTRY.

The systems of working the coal-seams after access is attained to them by the means described are two, known as the room-and-pillar and the long-wall systems. The room-and-pillar method—also known as the pillar-and-chamber or board-and-pillar method, which may include the pillar-and-stall system—is the oldest of the systems, and the one very generally used in the United States. By this system, coal is first mined from a number of comparatively small places, called rooms, chambers, stalls, boards, etc., which are driven either square from or at an angle to the haulageway. Pillars are left to support the roof. In the long-wall method the whole face of the coal-seam is taken out, leaving no coal behind, and the roof is allowed to settle behind as the excavation progresses, care being taken to preserve haulageways through the falling material. Both the room-and-pillar and the long-wall methods are employed in various modifications, for the details of which special treatises on coal-mines should be consulted. The coal is cut from the seam by hand or by some form of coal-cutting machine. In America machine cutting is used extensively. There are four general types of machines in general use: Pick machines, chain-cutter machines, cutter-bar machines, and long-wall machines; the machines most used in America are pick machines and chain-cutter machines. Both compressed air and electricity are used for operating coal-cutting machines. Pick machines are very similar to a rock-drill; chain-cutter machines consist of a low metal bed-frame upon which is mounted a motor that rotates a chain to which suitable cutting teeth are attached. The ventilation of the workings, owing to the presence of gases, is a very important feature of coal-mining, and great care is taken to lay out the workings so as to facilitate ventilation. Mechanical ventilation by means of fans and blowers (see BLOWING MACHINES) is usually employed. Hoisting in mines is accomplished by means of cages running up and down the shafts, and operated by large hoisting engines on the surface. There are two general systems of hoisting in use—hoisting without attempt to balance the load, in which the cage and its load are hoisted by the engine and lowered by gravity, and hoisting in balance, in which the descending cage or a spe-

COAL-MINING



1. SULLIVAN ELECTRIC CHAIN MACHINE, Making "tight" or corner cut.

2. SULLIVAN ELECTRIC CHAIN MACHINE, Cutting across face of room.

cial counter-balance assists the engine to hoist the loaded ascending cage. Haulage in mines is accomplished by animal power or by steam hoisting engines operating a system of rope haulage or by mine locomotives operated by steam, electricity, compressed air, or gasoline.

The preparation of mined coal for the market consists in screening the coal over bars and through revolving or over shaking screens, together with breaking it with rolls to produce the required market size. The large lumps of slate or other impurities are separated by hand, while the smaller portions are picked out by automatic pickers or by hand by boys or old men seated along the chutes leading to the shipping pockets or bins. When coal contains much sulphur, this is frequently removed by washing it with water in special washing plants.

BIBLIOGRAPHY. Lesley, *Manual of Coal and Its Topography* (Philadelphia, 1856)—a good work, but difficult to find; Chance, "Coal-Mining," in *Second Geological Survey of Pennsylvania, Report AC* (Harrisburg, 1883); Hughes, *A Textbook of Coal-Mining* (London, 1899); Peel, *Elementary Textbook of Coal-Mining* (London, 1901); Macfarlane, *The Coal Regions of America, Their Topography, Geology, and Development* (New York, 1875); Nicolls, *The Story of American Coals* (Philadelphia, 1897); Lesley and others, "Reports on the Coal-Fields of Pennsylvania," in various publications of the *Second Geological Survey of Pennsylvania* (Harrisburg). Numerous scattered papers have been published in the following annuals and periodicals: *Transactions of the American Institute of Mining Engineers* (New York); *The Mineral Industry* (New York); *The Engineering and Mining Journal* (New York); *Mines and Minerals* (Scranton, Pa.); "Mineral Resources of the United States," *United States Geological Survey* (Washington). For foreign coal deposits, consult: *Memoirs of the Geological Survey of Great Britain* (London); *Reports of Progress of the Geological Survey of the United Kingdom* (London); *Annales de la société géologique de Belgique* (Liège, 1874 et seq.); *Bulletin de la société belge de géologie, de paléontologie et d'hydrologie* (Brussels, 1877 et seq.); *Annales des mines* (Paris, 1816 et seq.); *Bulletin de la société géologique de France* (Paris, 1896 et seq.); Lozé, *Les charbons britanniques et leur épuisement* (Paris, 1900); *Zeitschrift für praktische Geologie* (Berlin, 1893 et seq.). See ANTHRACITE; BITUMINOUS COAL; CARBONIFEROUS SYSTEM; CORE; CULM; CRETACEOUS SYSTEM; PEAT; TERTIARY SYSTEM; GRAPHITE; CARBON; FIRE-CLAY; and the articles on the different States and countries in which coal has been found.

COAL APPLES. The name given to some curious specimens of spheroidal anthracite coal found in the Mammoth seam of Pennsylvania. They vary from one-fourth inch to ten inches in diameter, but are usually about the size of a hen's egg. They are thought to be due to jointing.

COAL-BREAKER. A structure containing machinery for the purpose of crushing, sorting, and cleaning anthracite coal. The breaker is often as much as 150 feet high, and rarely less than 80 feet. The coal, as it is hoisted out of the mine, is carried up to the top of the breaker and discharged into a hopper, whence it passes

downward over bars, through screens and crushers, and is finally discharged into bins at the bottom. The admixed slate is separated partly by special screens, and the slaty coal (bone coal) is picked out by boys as it slides down the chutes. In the more modern breakers water-jigs are used very successfully to separate the slate and coal. The sizes produced are described in the article on ANTHRACITE. The capacity of a coal-breaker is commonly about 1000 tons per day, but some exceed 2000 tons in output. Consult Chance, "Report on Coal-Mining," *Report AC of the Second Geological Survey of Pennsylvania* (Harrisburg, 1883).

COALFISH (so named from its color). (1) The pollack (q.v.). (2) A singular and interesting eliid fish (*Anoploma fimbriata*) of the North Pacific, which is usually slaty-black above and white below, but variable with age and place. It is about 18 inches long, allied to the rock-trout, and called in California beshow, candlefish, and skilfish.

COAL-GAS. See GAS, ILLUMINATING.

COALING SHIP. In modern naval vessels coaling ship has become an operation of importance. Special machinery is provided for handling it, and the men are drilled at coaling expeditiously. Notwithstanding all that can be done in the way of drill and the improvement of appliances, the operation of coaling must take many hours, and in time of war may necessitate a trip to the nearest coaling-station. This loss of time may prove most serious and defeat the plans of a campaign. Means of coaling at sea without leaving station, or while en route to a place, are therefore sought. Several plans have been devised, in the most successful of which a steel hawser runs between the collier and the vessel to be coaled, starting from a high point on the collier's mast. This serves as a stay on which bags, carried by a trolley, pass to and fro, very much after the fashion of a cableway (q.v.).

COAL-MEASURES. See COAL; CARBONIFEROUS SYSTEM.

COAL-OIL. See PETROLEUM.

COAL-TAR, or GAS-TAR. The thick, black, opaque liquid that comes over and condenses in the pipes when gas is distilled from coal. It is slightly heavier than water, and has a strong, disagreeable odor. Coal-tar is a mixture of many distinct liquid and solid substances, and the separation of the more useful of these constitutes an important branch of manufacturing chemistry. By distilling from wrought-iron stills, the tar is first broken up into five fractions, which are then further subjected to fractional distillation separately:

(1) *Crude Naphtha* or *Light Oil* is the fraction distilling over before the temperature of the tar has risen to 170° C. This portion contains a number of valuable hydrocarbons, including benzene, toluene, xylene, etc. Another important product obtained from this fraction is the so-called solvent or burning naphtha of commerce, which is largely used for burning in lamps, as a solvent for india-rubber and gutta-percha, and for a variety of other purposes. The benzene obtained from this fraction is also used as a solvent, though most of it is converted into aniline, all of the vast amount of aniline manufactured at present being derived from nitro-

benzene, which is, in its turn, made from benzene. To separate its constituents, the crude naphtha is first divided into three fractions by distillation; each of these fractions is washed successively with sulphuric acid and caustic soda, as well as with water, and subjected to further fractional distillation.

(2) *Middle Oil* or *Carbolic Oil* is the crude fraction distilling over from tar between the temperatures of 170° and 230° C. This fraction contains large quantities of naphthalene and carbolic acid, the former separating out in the form of a crystalline mass, while the latter remains liquid. The naphthalene thus obtained is purified by washing with caustic soda and sulphuric acid, and distilling. On the other hand, the crude liquid is treated with caustic-soda solution, which takes up all of the carbolic acid and from which the latter is separated by adding sulphuric acid; the impure carbolic acid thus obtained is further purified by distillation. Naphthalene is extensively used in the manufacture of colors. Carbolic acid is extensively used as a disinfectant and for the manufacture of picric acid.

(3) *Creosote Oil* is the crude fraction distilling over from coal-tar between the temperatures of 230° and 270° C. This somewhat heavy oil is largely used for the preservation of timber. See CREOSOTE.

(4) *Anthracene Oil* passes over above 270° C. This fraction yields all the anthracene of commerce; the anthracene crystallizes out from the oil, and is somewhat purified by washing with the solvent naphtha obtained from the first fraction. Anthracene is extensively employed in the manufacture of the beautiful alizarin dyes, which were formerly made from madder-root. See ALIZARIN.

(5) The *Pitch* remaining in the stills after the above fractions have passed over is used for making asphalt and varnishes, for protecting wood and metal work, etc.

Coal-tar is produced in large quantities in the manufacture of illuminating gas, and while scarcely half a century ago it was looked upon as nothing but an offensive waste product, at present it constitutes the source of innumerable substances of the greatest value to both science and the industries. See BIBLIOGRAPHICAL REFERENCES under COAL-TAR COLORS; GAS, ILLUMINATING; and see the articles on the various products mentioned above.

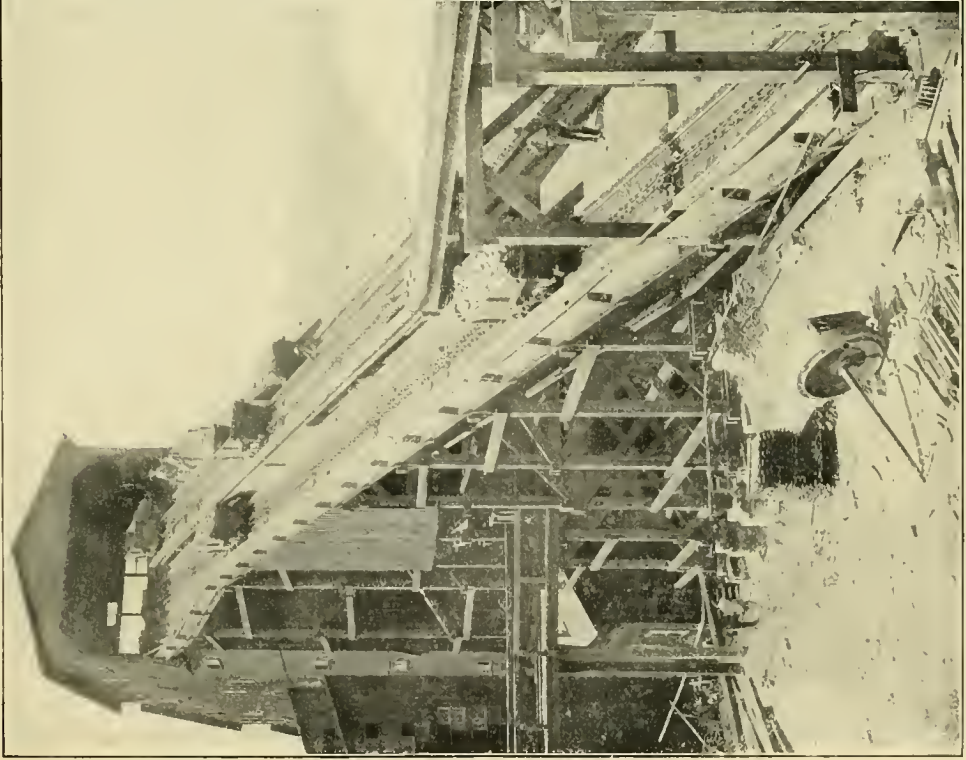
COAL-TAR COLORS. Coloring matters artificially prepared from coal-tar, chiefly from the hydrocarbons extracted from it. (See COAL-TAR.) The first observation of a colored compound of this class was made by Runge in 1834; but the real beginning of the great modern color industry dates from 1856, when W. H. Perkins obtained a violet dyestuff by oxidizing impure aniline with chromic acid, took out a patent for it, and commenced manufacturing it in England. Many other dyes were subsequently obtained from aniline and the substances related to it, by A. W. Hofmann, Gries, Girard, Lauth, and many others. But the most sensational step was the preparation by Graebe and Liebermann (1868) of a natural dyestuff—viz. the coloring principle of madder-root, from the anthracene of coal-tar. In 1880 indigo was first prepared, not from coal-tar products, but by a purely synthetic method, and other natural colors have

since been prepared in a similar manner; so that natural dyestuffs reproduced by artificial means need not necessarily originate from coal-tar. The artificial indigo and alizarin are not mere substitutes for the natural indigo and madder; they are chemically identical with them, and surpass them in purity, and their adaptability to special methods in dyeing and printing often makes them even more desirable. But as the cost of manufacture is high, they compete with the natural products on about equal terms. The color industry was first developed in England and France, but the more thorough technical instruction at the German universities produced a body of skilled manufacturers and investigators who soon took the lead. At present, in addition to the great factories near Berlin, Frankfurt, Elberfeld, and Mannheim, and a host of smaller ones in various parts of Germany, German capital controls many of the establishments in France, Russia, and other countries. The United States possess few independent factories, and the list of their products is rather limited; indeed, American dyers appear to call for a smaller range of dyestuffs than those of other countries. A peculiar development of the last fifteen years is the extension of the methods of the dye industry to the production of artificial drugs, such as antipyrin, antifebrin, etc., many of which are manufactured in the same establishments which control the dye patents.

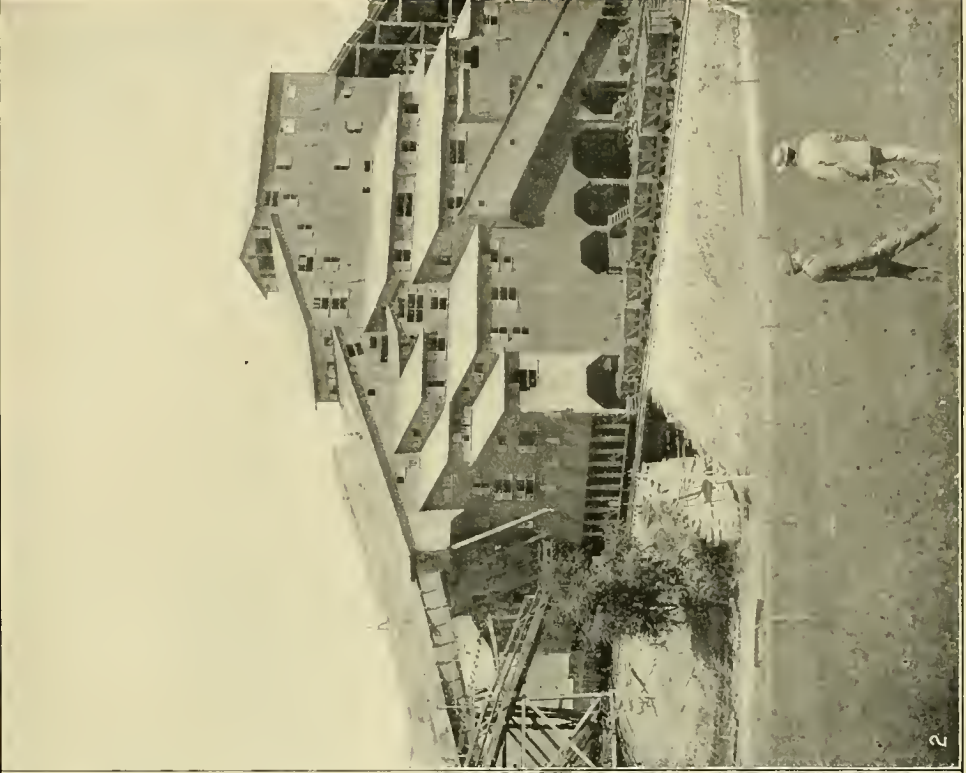
CLASSIFICATION. Artificial colors were formerly classified merely according to the sources from which they were obtained. Thus, many of them, including magenta, 'aniline blue,' 'aniline green,' 'aniline yellow,' etc., were grouped together as *aniline colors*. At present somewhat different systems of classification are used by different authors, but all systems are based exclusively on the chemical constitution of the dyes.

Many attempts have been made to find a general answer to the question. What must be the chemical nature of a carbon compound in order that it may be a dye? An all-embracing answer to this question has not yet been found. But experience has shown that the true dyestuffs exhibit peculiar groupings of the constituent atoms. Such 'chromophore' groupings produce, however, only a *tendency* toward color, but not necessarily colors; indeed, many compounds containing them are perfectly colorless, and the majority of true dyes become colorless if deprived of the small amount of oxygen they contain, although their chromophore groups may not be in the least affected. If, however, a chromophore group is combined with certain other atomic groups, the result is a dye. For example, the so-called *azo-group* ($-N=N-$) is chromophoric; the compound called azobenzene, $C_6H_5-N=N-C_6H_5$, although colored red and evidently containing the azo-group, is not a dye; but it becomes one when the so-called *amido-group* (NH_2) also is introduced into its molecule, the compound $C_6H_5-N=N-C_6H_4NH_2$, called *amido-azobenzene*, being a true dye. If, instead of the amido-group, a hydroxyl group (OH) is introduced, the result is again a dye (an orange one). Further, the tints of dyes are produced by variation in the 'substituting' groups which replace hydrogen in the primitive molecule. Thus, the introduction of the

COAL-MINING



1. INCLINED PLANE FROM MINE TO BREAKER.



2. VIEW OF TYPICAL BREAKER.

methyl group (CH_3) generally increases the violet tendency; the phenyl group (C_6H_5) produces bluish tints; the naphthyl group (C_{10}H_7) a tendency toward brown-red, etc. The relative position of the groups likewise plays a large part in the determination of color. But, as we have already observed, a definite and all-embracing rule does not exist. Frequently compounds must enter into combination with a base or an acid before they will fix themselves upon the fibre, and then the tints are frequently affected by the different bases or acids to a varying degree. For example, alizarin dyes red with the hydroxide of aluminum, and black with the hydroxide of iron.

For the purposes of the present sketch, the coal-tar colors may be grouped in five classes: viz. the azo-colors; triphenyl-carbinol derivatives; quinone derivatives; diphenyl-amine derivatives; and indigo dyes.

Azo-COLORS. The characteristic compound of this class is azo-benzene, $\text{C}_6\text{H}_5\text{N}=\text{NC}_6\text{H}_5$, already mentioned above. We have seen that the introduction of either NH_2 or OH in place of a hydrogen atom produces a coloring matter—yellow in the former, orange in the latter instance. Replacing either or both of the phenyl groups (C_6H_5) by more complex hydrocarbon groups deepens the tone (with a tendency toward the redder tints), increases the affinity for fibres, and diminishes the liability to fade. The earlier dyes of this class, such as 'aniline yellow,' 'Bismarck brown,' 'chrysoidin,' etc., were singularly brilliant, but were not fast; whereas the browns and the many reds, ranging from scarlet to purple, which are now produced under the names of ponceaux or bordeaux, congos, quinoline red, etc., are exceedingly permanent. In manufacturing this class of dyes, nitrous acid is allowed to act upon an ice-cold solution of the salt of any primary base (like aniline), and the 'diazosalt' formed is allowed to act on another base or a phenol; an endless variety of combinations is thus possible.

TRIPHENYL-CARBINOL DERIVATIVES. These represent the first discoveries in the aniline dyes, and some of them are still produced on the largest possible scale. The fundamental compound of the class is triphenyl-carbinol (C_6H_5)₃COH, and its derivatives are properly subdivided into *rosanilines*, *rosolic acids*, and *phthaléins*.

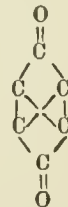
In the rosaniline group, two or three amido-groups (NH_2) are introduced in place of hydrogen atoms of the phenyls (C_6H_5). The *di-amido*-compounds are green; the *tri-amido*-compounds are red, violet, or blue. Strictly speaking, the compounds thus obtained are not themselves dyes, but are bases which must first be combined with suitable acids, and thus brought into a soluble form. Their salts are beautifully crystalline bodies in the solid condition, showing colors quite different from those of the solutions, and having peculiar lustres like those of beetles' wings. The solutions have very intense colorations and stain animal fibres readily and permanently, although they do not fix themselves easily upon cotton or linen. They are the most brilliant and lively dyes, but are strongly affected by sunlight, and are consequently less useful than some dyes of other classes. They are generally manufactured by oxidizing processes at a comparatively high temperature, whereby two or three simpler compounds are welded, as it

were, into compounds of complex molecular structure. Thus, in the manufacture of the well-known magenta dye (a tri-amido-compound) approximately equal quantities of aniline, ortho-toluidine, and para-toluidine are heated from 8 to 10 hours with arsenic oxide to 190°C ., in large iron kettles. A very thick mass results, which can be extracted with hot water, and the compound thus obtained is found to be made up of molecular quantities of aniline, ortho-toluidine, and para-toluidine, chemically combined.

Rosolic acid and its derivatives are made by the condensation of various phenols, three phenols being condensed into one compound of the rosolic acid group, just as three bases are condensed into one compound of the rosaniline group. The comparatively few dyes of this group give various shades of red. The hydroxyl groups, and hence the acid character of the phenols, remain unchanged in the products of condensation; the latter therefore combine with bases, and then they readily go into solution.

The phthaléins differ from the rosolic acids in so far as one of the three phenyls of the triphenyl-carbinol is connected in them with a carboxyl group (COOH), the other two phenyls having one or more hydroxyls apiece, as in the rosolic acids. The phthaléins were discovered by Adolph Baeyer, and are chiefly remarkable for the fluorescence of their alkali salts in solution. They are prepared by heating phenols with phthalic anhydride and a little sulphuric acid; when resorcin is taken as the phenol, a very well-known compound is obtained, which has been called *fluoresceïn*, while its sodium salt is known as *uranin*. Solutions of the latter are yellow by transmitted light, but bright green by reflected light. This fluorescence is so intense that it is distinctly noticeable in extremely dilute solutions; so that this salt has been used to trace subterranean watercourses supposed to connect two neighboring bodies of water, the dye being thrown into one of these and fluorescence being subsequently noticed in the other. The potassium salt of a brominated fluoresceïn is *eosin*, $\text{C}_{20}\text{H}_6\text{O}_6\text{Br}_2\text{K}_2$, with a magnificent red and yellow fluorescence. These fluorescences disappear on the fibre, but eosin and analogous substances impart very brilliant flesh-tints to silk and wool.

THE QUINONE DERIVATIVES. These contain the characteristic nucleus—



and are almost invariably colored, although they become suitable for dyes only when they also contain several hydroxyl groups. By far the most important substance of this class is alizarin (q.v.), which was already mentioned as identical with the active principle of madder. Anthracene (q.v.), a coal-tar hydrocarbon, is converted into anthraquinone by heating with potassium bichromate and sulphuric acid; the anthraquinone is acted upon by fuming sulphuric

acid, and the resulting compound is melted with caustic soda, yielding a sodium salt of alizarin. This is soluble in water with a fine red color, but does not fasten upon any kind of fibre. If, however, cotton is previously impregnated with salts of aluminum, iron, or chromium, the alizarin will form insoluble salts ('lakes') with these metals; and as the precipitation occurs within the pores of the fibre, subsequent washing cannot remove it. Colors of this class of dyes are not suitable for silk and wool, but are very intense and permanent when properly applied to cotton.

THE DIPHENYL-AMINE DERIVATIVES. These include many varieties of dyes, such as the indulins, indophenols, thiagins, etc. Their chemistry is too involved to be disposed of in a few words. It may, however, be mentioned that their characteristic groups are similar to anthraquinone, excepting that the oxygen of the latter is replaced by sulphur, imido-groups, etc. The more important dyes of this class include 'methylene blue' and 'aniline black.'

INDIGO DYES. By far the most important of these is indigo itself, a vegetable dye obtained from a tropical plant cultivated in India since the earliest times. The sap of this plant, when fermented under conditions excluding oxygen, yields *indigo white*, a soluble material having the formula $C_{16}H_{12}N_2O_2$; if the fermentation proceeds in the open air, *indigo blue*, $C_{16}H_{10}N_2O_2$, is produced. This substance is a derivative of the base called indol, C_8H_7N , which occurs ready-formed, in small quantities, in many animal and vegetable secretions. It can be prepared artificially from aniline and chloraldehyde. When indigo was found to consist of two indol molecules joined together and oxidized, the clue for the production of artificial indigo was at hand. It has since been found that any benzene derivative having a nitrogenous group and a two-carbon group in the 'ortho' position may give rise to the formation of indigo. The first practical method, devised by Baeyer in 1880, involved the action of potassium hydroxide on ortho-nitropropionic acid; but many other methods have been devised since then, such as the action of melted potassium hydroxide on bromacetanilid, the action of halogenated acetone on aniline, etc. Indigo is one of the most reliable dyestuffs, both as to brilliancy and permanency, and there is little difference in these respects between the natural and artificial products. The finished compound can, however, only be applied after reduction to the soluble indigo-white, and this makes its use in dyeing and printing somewhat cumbersome. In some of the methods for preparing artificial indigo, the fibre can be impregnated with one ingredient and the other applied either in the dye-vat or from the printing-rolls; consequently, indigo can be and is often directly prepared in the quantities and in the places in which it is needed. See **INDIGO**.

LIST OF COLORS. The following are some of the best known commercial coal-tar colors, their molecular formulas, and the principal methods employed in their manufacture.

Aldehyde Green.—See Aniline Green below.

Aniline Black, $C_{20}H_{12}N_3$, made by the oxidation of aniline with mineral salts.

Aniline Blue (triphenyl-rosaniline hydrochloride), $C_{24}H_{18}N_3Cl$, made by heating rosaniline, benzoic acid, and aniline, and subsequently adding hydrochloric acid.

Aniline Brown, Bismarck Brown, or Phenylene Brown (triamido-azobenzene), $C_{12}H_{13}N_3$, made by the action of nitrous acid on metaphenylenediamine.

Aniline Green, or Aldehyde Green, $C_{22}H_{27}N_3S_2O$, made by the action of ordinary aldehyde on an acid solution of rosaniline sulphate and the subsequent addition of sodium hyposulphite.

Aniline Orange.—This name is applied to various compounds made by the action of amidosulphonic acids on phenols. The name is often applied to the so-called Victoria Orange, $C_7H_6N_2O_3$.

Aniline Red.—See Fuchsin below.

Aniline Scarlet, $C_{18}H_{15}N_2O_4SSa$, made by the action of diazoxylene on naphthosulphonic acid.

Aniline Violet.—See Mauvein below.

Aniline Yellow (hydrochloride), $C_{12}H_{12}N_3Cl$, made by the action of nitrous acid on an excess of aniline.

Alizarin, $C_{14}H_8O_4$, made artificially by successive treatments of anthracene with chromic acid and fuming sulphuric acid, and melting the product with potassium hydroxide. Among the dyes allied to alizarin are: *Alizarin Black*, $C_{10}H_6O_4.NaHSO_3$; *Alizarin Blue*, $C_{17}H_6NO_4$; *Alizarin Orange*, $C_{14}H_7NO_6$; and *Alizarin Violet*, or Gallein, $C_{20}H_{10}O_7$.

Auramin (hydrochloride), $C_{17}H_{24}N_3OCl$, made by the successive action of phosgene gas (carbon oxychloride) and ammonia upon dimethylaniline.

Aurantia (ammonium salt of hexanitro-diphenylamine), $C_{12}H_6N_7O_{12}.NH_4$, made by the action of nitric acid on methyl-diphenylamine.

Aurin, $C_{19}H_{14}O_3$, made by the action of oxalic and sulphuric acids on phenol.

Benzaldehyde Green.—See Malachite Green below.

Benzidine Red.—See Congo Red below.

Benzopurpurins, dyes of various scarlet shades. They are chemically allied to Congo Red (which see below), and are made by treating salts of toluidine (which is made from nitrotoluene, and is analogous to benzidine) with nitrous acid, and combining the resulting salts with α - and β -naphthylamine sulphonic acids.

Bismarck Brown.—See Aniline Brown above.

Blackley Blue.—See Indulin below.

Bordeaux.—See Ponceaux below.

Chrysoïdin (hydrochloride), $C_{12}H_{15}N_4Cl$, made by the action of diazo-benzene chloride on metaphenylenediamine in aqueous solution.

Congo Red, or Benzidine Red, $C_{22}H_{22}N_6S_2O_6Na_2$, made by the action of nitrous acid and then of sodium naphthionate on benzidine hydrochloride.

Eosin, $C_{20}H_6O_5Br_4K_2$, or $C_{20}H_6O_5Br_4Na_2$, made by the action of bromine on fluoresceïn.

Erythrosin, $C_{20}H_6O_5I_4Na_2$, made by the action of iodine on fluoresceïn.

Fluoresceïn, $C_{20}H_{12}O_5$, made by the action of phthalic acid anhydride on resorcin.

Fuchsin, Rosaniline Hydrochloride, Magenta, or Aniline Red, $C_{20}H_{20}N_3Cl$, made by the oxidation of toluidine and aniline in the presence of acids.

Gallein.—See Alizarin above.

Helianthin.—See Methyl Orange below.

Indigo.—See text of the article above.

Indulin, or Blackley Blue, $C_{11}H_{15}N_3$, made by heating aniline salts with amidoazobenzene.

Magenta.—See Fuchsin above.

Malachite Green, Benzaldehyde Green, or Victoria Green, $3C_{23}H_{25}N_2Cl_2 \cdot 2ZnCl_2 + H_2O$, made by the condensation of benzaldehyde with dimethylaniline, and the subsequent addition of hydrochloric acid and zinc chloride.

Martius's Yellow, $C_{10}H_7N_2O_3SNa$, made by the action of nitric acid on α -naphthol-monosulphonic acid.

Mauveïn (hydrochloride), or Aniline Violet, $C_{27}H_{25}N_4Cl$, made by the action of chromic acid on aniline containing some toluidine.

Methyl Orange, $C_{13}H_{12}N_2SO_3Na$, made by the successive action of nitrous acid and methyl-aniline upon para-amidobenzene-sulphonic acid; it is the sodium salt of helianthin.

Methyl Violet, $C_{23}H_{23}N_3Cl$, made by oxidizing dimethyl-aniline with metallic salts.

Methylene Blue, $C_{16}H_{18}N_3SCl$, made by heating amido-dimethylaniline with sulphide of iron.

Naphthol Yellow, $C_{10}H_6N_2O_3SK$, made by the action of nitric acid on α -naphthol-trisulphonic acid.

Nigrosin, $C_{15}H_{15}N_3$, made by heating aniline salts with nitrobenzene.

Night Blue, $C_{28}H_{31}N_3O$ (the hydrochloride of this is the commercial dye), made by heating pararosaniline with aniline and benzoic acid.

Pararosaniline (chloride), $C_{13}H_{13}N_3Cl$, made by oxidizing a mixture of para-toluidine and aniline with arsenic acid, or nitrobenzene.

Phenylene Brown. See Aniline Brown above. *Ponceaux*, or *Bordeaux*.—Various derivatives of azonaphthalene. "Ponceau 3R," $C_{10}H_{16}N_2O_7S_2Na_2$, is made by combining diazo-eumene chloride with β -naphthol-disulphonic acid.

Primulin, $C_{11}H_{12}N_2S(?)$, made by the action of sulphuric acid on thiotoluidine.

Resorcin Yellow, or *Tropæolin*, O, $C_{12}H_{10}N_2O_5S$, made by the action of diazobenzene-sulphonic acid on resorcin.

Rhodamine (hydrochloride), $C_{28}H_{31}N_2O_3Cl$, made by the action of phosphorus trichloride on fluoresceïn, and treatment of the product with diethylamine.

Roccellin, $C_{20}H_{13}N_2O_4SNa$, made by the action of β -naphthol on the diazo-compound of naphthionic acid.

Rosaniline.—See Fuchsïn above.

Rose Bengale, $C_{20}H_7Cl_2I_2O_5K_2$, made by the successive action of chlorine and iodine upon fluoresceïn.

Rosolic Acid, $C_{20}H_{10}O_3$, closely allied to aurin; neither aurin nor rosolic acid is specially valuable.

Safranin, $C_{21}H_{21}N_4Cl$, made by the oxidation of a mixture of toluylene-diamine and aniline or toluidine.

Tropæolin.—This name is applied to various compounds made by the successive action of nitrous acid and phenols upon amidobenzene sulphonic acids. See Resorcin Yellow above.

Uranin, $C_9H_{10}O_5Na_2$, the sodium salt of fluoresceïn (which see above).

Victoria Green.—See Malachite Green above.

Victoria Orange.—See Aniline Orange above.

BIBLIOGRAPHY. Schultz, *Die Chemie des Steinkohlentheers* (Brunswick, 1890); Villon, *Traité pratique des matières colorantes artificielles* (Paris, 1890); Cazenove, *Répertoire analytique des matières colorantes artificielles* (Lyons, 1893); Schultz and Julius, *Systematic Survey of the Organic Coloring Matters*, translated by Green (New York, 1894); Hurst, *Dic-*

tionary of the Coal-Tar Colors (London, 1896); Lefèvre, *Traité des matières colorantes organiques artificielles* (2 vols., Paris, 1896); Seyewetz and Sisley, *Chimie des matières colorantes artificielles* (Paris, 1897); Benedikt, *Chemistry of the Coal-Tar Colors*, translated by Knecht (London, 1900); Nietzki, *Chemistry of the Organic Dyestuffs*, translated by Collin and Richardson (London, 1892; newer German edition, Berlin, 1901). A journal devoted to the progress of the coal-tar industry has, since 1877, been published in Berlin by Friedländer, under the title, *Fortschritte der Theerfarben-Industrie und verwandter Industriezweige*. The most important dyestuffs will be found described in some detail under their special names. See also DYEING; TEXTILE PRINTING.

COALVILLE. A town of Leicestershire, England, 16 miles northwest of Leicester, in the midst of a coal district. Population, in 1901, 15,300.

COALVILLE. A city and the county-seat of Summit County, Utah, 40 miles southeast of Ogden; on the Union Pacific Railroad (Map: Utah, B I). It is in a coal-mining region. Population, in 1890, 1166; 1900, 808.

COAN, kō'an, Trus (1801-82). An American missionary, born in Connecticut. He was ordained as a Congregational minister in 1833, and in that year made a trip of exploration to Patagonia, where he wished to establish a mission. Circumstances were unfavorable, and he returned, but soon afterwards went to the Hawaiian Islands, and for forty-seven years was stationed as a missionary at Hilo. Besides his work as a missionary, Dr. Coan published many valuable papers on the volcanoes of Hawaii, and two books entitled *Adventures in Patagonia* (1880) and *Life in Hawaii* (1881).

COANZA, kō-än'zä. See KUANZA.

COASTAL PLAIN. In physiography, the name given to a portion of the North American Continent bordering the Atlantic Ocean and the Gulf of Mexico. From New York to Georgia the Coastal Plain includes the strip of low-lying lands that is limited on the east by the Atlantic and on the west by the first foot-hills of the Appalachian Mountain system. In northern Alabama the Coastal Plain passes around the southern limit of the Appalachians, after which it widens out and reaches northward as far as the Ohio River. West of the Mississippi River it extends with decreasing width southwestward into Mexico. The peculiar features of the Coastal Plain are its low elevation and the predominance of stratified rock-formations of recent geological age. On the outer border the surface is flat and raised but little above sea-level; toward the interior there is an increasing diversity of relief owing to the higher elevation and the extensive erosion by streams. The western limit of the plain, where the horizontal strata give way to the upturned and eroded rocks of the Appalachians, is marked by a sharp slope and by numerous cataracts. Geologically the Coastal Plain consists of Cretaceous, Tertiary, and Quaternary beds, which still retain the relative positions they acquired during deposition, although they have since been elevated above sea-level. Consult Mill, *The International Geography* (New York, 1900). See AMERICA; UNITED STATES.

COAST AND GEODETIC SURVEY, UNITED STATES. A bureau of the Treasury Department which has for its object, first, the survey of the coasts of the United States, principally for the benefit of commerce; and, second, the task of determining the magnetic elements, exact elevations, and geographical positions of the interior. The origin of the survey dates from recommendations made by President Jefferson in 1807 in his message to Congress. As the result of these recommendations an act of Congress, approved February 10, 1807, authorized a survey of the coast of the United States and appropriated \$50,000 to pay for beginning the work. On March 25, 1807, a circular letter from the Secretary of the Treasury requested plans for the execution of the work. Nothing was immediately done beyond the consideration of these plans, and no further action was taken until April 16, 1811, when F. R. Hassler (q.v.), whose plans had been approved by President Jefferson, was sent to Europe to procure the necessary instruments. Mr. Hassler's proposed plan, briefly stated, was to determine the positions of certain prominent points of the coast by astronomical observations and to connect these points by trigonometrical lines from which to make a geodetic survey. Mr. Hassler sailed for Europe on August 29, 1811, and owing largely to the war between England and the United States which intervened, he spent four years in England and on the Continent, returning to the United States with his outfit complete on October 16, 1815. Field work was actually begun on August 6, 1816, under the direction of Mr. Hassler as superintendent. From this time until April 14, 1818, operations were continued in the vicinity of New York City. A base line was measured in the valley of English Creek, May 7, 1817, and one of verification, twice measured, was completed on December 6 of the same year. The triangulation connecting these measured lines represents the nucleus of the work of the Coast Survey and embodies its first tangible results. The trigonometric work now spans the country from the Atlantic to the Pacific and from Maine to Mobile; it covers the entire coast and promises ultimately through the cooperation of Canada and Mexico to encompass the continent from Acapulco to the Arctic Ocean. On April 14, 1818, it was enacted by Congress that so much of the law relating to the survey of the coast as authorized the employment of other persons than those belonging to the army and navy be repealed. Between 1818 and 1832 little work was done. The instruments, records, and funds were transferred to the War Department, and the Coast Survey may therefore be considered as in army service during this period.

In 1823, 1824, and 1825 efforts were made by the Navy Department to establish a hydrographic corps, but public sentiment favored a return to the ideas of Jefferson. Bills were introduced in Congress in 1828 and in 1831, and one was finally passed, on July 10, 1832, carrying into effect the original law of 1807. On August 9 of the same year Mr. Hassler was again appointed superintendent. Field work was resumed in April, 1833. Less than a year later, March 12, 1834, the administration of the Survey was transferred from the Treasury Department to the Navy Department. Mr. Hassler, however, remaining in charge. These conditions

held for two years, when a transfer was effected on March 25, 1836, and the Treasury Department again assumed control. Operations continued without interruption until March 30, 1843, when a Board of Reorganization was convened with Mr. Hassler as chairman. The plan submitted by this board practically continued in force the plans which had been formulated and acted upon in former years by Mr. Hassler. The scientific organization of the Survey may, therefore, be properly said to date from 1832. The minor details of the organization have been changed at various times so that the present is in part the result of a gradual evolution. Mr. Hassler died on November 20, 1843, having held the office of superintendent twice, from August 3, 1816, to April 14, 1818, and from August 9, 1832, to November 20, 1843. During his incumbency of office the original triangulation in the vicinity of New York City was extended eastward to Point Judith, Rhode Island, and southward to Cape Henlopen, Delaware. Altogether the area included in this triangulation amounted to 9000 square miles, and determined the positions of about 1200 stations to be used in the delineation of about 1600 miles of shore line. Mr. Hassler was succeeded by Prof. A. D. Bache (q.v.), who became superintendent on December 12, 1843. Professor Bache extended the triangulation along the South Atlantic Coast and among the Florida Keys. He also instituted regular and systematic observations of the tides and the Gulf Stream and investigated magnetic forces and directions.

The Civil War practically stopped the survey, although many of its officers were assigned to service on Federal war vessels, where their knowledge of the coast waters proved of great service in the various naval operations which were conducted by the Northern fleets. In 1867 Professor Bache died and was succeeded by Prof. Benjamin Pierce, of Harvard University, who served until February 17, 1874. Since then the successive heads of the Survey have been: Carlisle Patterson, who served until his death in 1881; Prof. Julius E. Hilgard, who resigned in 1885; Frank M. Thorn, who resigned in 1889; Prof. T. C. Mendenhall, who resigned in 1894 to become president of Worcester Polytechnic Institute; Gen. W. W. Duffield, who resigned in 1898; Prof. Henry S. Pritchett, who resigned in 1900 to become president of Massachusetts Institute of Technology, and O. H. Tittman, who was appointed superintendent in 1901.

Turning now to the present organization of the Survey, the original and the principal purpose of the organization is a survey of the coasts of the United States primarily for the benefit of commerce. It is charged with the duty of publishing all results of such a survey that may be useful to the public. There has been added to its original duty, by legislation, that of determining the magnetic elements, exact elevations, and geographical positions of the interior. In 1878 the name of the organization was changed by Congress from Coast Survey to Coast and Geodetic Survey, in recognition of the extension of its functions to include triangulations in the interior.

The Coast and Geodetic Survey is a bureau of the Treasury Department; the head of the bureau, known as the superintendent, reports to the Secretary of the Treasury. The superintendent is charged with full responsibility in

every respect for all the work of the bureau. He is aided in such of his duties as cannot be delegated to officers of lower rank by an assistant superintendent, who acts as superintendent in his absence. Eight officers or groups of officers report directly to the superintendent and assistant superintendent, viz.: (1) The assistant in charge of the office; (2) the inspector of hydrography and topography; (3) the inspector of geodetic work; (4) the inspector of magnetic work; (5) the disbursing officer; (6) the editor; (7) the chiefs of field parties; (8) the heads of sub-offices. The first four of these officers have a general supervision over all the operations of the Survey both in the field and office, each acting as an advisory officer to the superintendent in regard to specified portions of the work. The functions of the fifth and sixth officers are stated fully further on. The officers in groups seven and eight have direct charge of all operations in the field. Each field party is a temporary organization which is created for a specific operation by an order of the superintendent, which makes one of the officers of the field force the chief of party, and, if necessary, assigns to him as subordinates one or more other officers from the same force. The party is disbanded when the work assigned to it has been completed. If the party is for duty on land the remainder of the organization of the party, the hiring of recorders, laborers, drivers, etc., is left entirely to the chief of party. If the party is for duty on a vessel, the assignment of an officer of the field force to command the vessel carries with it, necessarily, the command of the whole force on board the vessel, including watch and deck officers as well as crew. There were, in 1901, 60 officers on the field force. These officers are subject to office duty between field seasons. The Survey has its own fleet of 12 steamers and 6 sailing vessels, aside from launches and other small crafts. There are at present three sub-offices, each in charge of a field officer reporting directly to the superintendent, viz.: at Seattle, Wash.; San Francisco, Cal.; and Manila, P. I. The purpose of these sub-offices is to aid in the prompt dissemination of information, to serve as storage depots, and to save traveling expenses by providing points at which field officers may be temporarily assigned to office duty between the seasons. At the Manila sub-office the publication of preliminary charts is authorized.

The inspector of hydrography and topography, reporting directly to the superintendent, has a general supervision over the classes of field work indicated in his title, places before the superintendent plans for such work, makes the necessary inspection in the field to insure that the superintendent's orders are carried out economically and effectively, and is especially charged with the supervision of all matters relating to the ships and their personnel. *The Coast Pilot*, a publication giving full description of the coast from the mariner's point of view, sailing directions, warnings as to dangers to navigation, and other information of special value to navigators, is prepared under his direction. The inspector of geodetic work, reporting to the superintendent, is charged with the duty of preparing plans for the field operations of triangulation, astronomical determinations and precise leveling, and of making inspections of parties in the field, and of records and correspondence received at the of-

fice from field parties, with a view of insuring that the field operations are in accordance with the superintendent's orders, are of the desired degree of accuracy, and are efficient and economical.

The inspector of magnetic work, reporting to the superintendent, is charged with similar duties in regard to the magnetic work of the Survey. The assistant in charge of the office, reporting to the superintendent, has charge of the office at Washington, is responsible for the safety and arrangement of archives and property, and receives all money paid to the Survey for charts and other publications. As the official head of the office, the chiefs of the following divisions of the office force report to him: Computing division, magnetic division, tidal division, drawing and engraving division, chart division, library and archives division, and instrument division. Each of these divisions, under the direction of the assistant in charge of the office, prepares replies for the superintendent's signature to such parts of the correspondence as fall within its particular field, and also furnishes such information and equipment to field parties as it is within their power to furnish. In the computing division, all computations in connection with triangulation, astronomical determinations, and precise leveling are made, appropriate registers of results are kept, and the results prepared for publication as rapidly as possible. The magnetic division and the tidal division deal similarly with the computations and publication of magnetic and tidal results, respectively.

The drawing and engraving division is divided into five sections: (1) the photographing section, engaged in reducing, enlarging, and reproducing drawings for various purposes; (2) the drawing section, engaged in making from the original topographical and hydrographical field sheets, the office drawings, which are the original from which charts are produced, either by engraving on copper or by photolithography; (3) the engraving section, engaged in copper-plate engraving; (4) the electrotype section, engaged in producing, from the original engraved copper plates by electrotype process, the copper plates actually used in printing the charts; (5) the printing section, engaged in printing charts from the copper plates (the lithograph printing is done by contract outside of the organization). The chart division is divided into two sections. The hydrographic section is engaged in completing unfinished hydrographic sheets sent in from the field, corrections of charts especially with reference to aid to navigation (lights, buoys, etc.), preparation of *Monthly Notices to Mariners* in regard to this matter, and the inspection of charts in their various stages of preparation. The chart section is engaged in applying such hand corrections to charts at the last opportunity before issuing, as have become necessary on account of such changes, principally in the aids to navigation, as have taken place after the chart was printed; and with the clerical work connected with the issue and sale of charts. The library and archives division has charge of the library of the Survey and the archives in which all hydrographic and topographic sheets and all the original records and computations are stored.

The instrument division has charge of all the instruments and general property. Many of the best of the new instruments for the Survey are made in this division and it is continually en-

gaged in the repairing and remodeling necessary to keep the instrumental outfit at a high standard of efficiency. The accounting division, at the head of which is the disbursing officer, is not a division of the office in the sense of reporting to the assistant in charge of the office. This disbursing officer makes all disbursements on account of the Survey, with the approval of the superintendent, renders a quarterly account of all such disbursements to the first auditor of the Treasury Department for auditing by him, renders a statement of expenditures and balances to the superintendent whenever required to do so, suspends returns for correction or disallows all items of expenditure irregular in form or in contravention of law or regulations, and refers to the first comptroller of the Treasury, for decision, all apparently excessive or unnecessary charges. The editor, reporting to the superintendent, compiles the administrative part of the annual report and acts as editor in connection with all other publications of the Survey except the charts.

COAST ARTILLERY, or FORTRESS ARTILLERY. Under this head are included the heavier guns and mortars, which are used for the armament of permanent works, usually on the sea-coast, and which are mounted on carriages not intended for transporting the guns, but only as supports from which they are to be fired. These carriages are designed so that the guns may be pointed in any direction at various angles of elevation and depression. They are classified as barbette, casemate, and flank defense, according to their use, and into front pintle (the pintle being the pivot or bearing containing the axis of rotation) and centre pintle according to the manner of traversing. Barbette carriages are intended to be fired over an open parapet, and are of two forms—fixed and disappearing. Disappearing carriages are hidden behind the parapet except when firing. They are of two classes—disappearing carriages proper and the gun-lift carriages. Casemate carriages are those mounted in a covered emplacement and fired through an embrasure (q.v.).

The modern seacoast cannon in the United States service are the 8, 10, and 12-inch breech-loading rifles and the 12-inch breech-loading mortar. In addition there is a 12 cm. (4.7 inch) rapid-fire gun, using a projectile weighing 45 pounds propelled by smokeless powder. The 8-inch rifle weighs 32,480 pounds and fires a 300-pound projectile with a charge of 125 pounds of powder. The 10-inch rifle weighs 67,200 pounds and fires a 575-pound projectile with 250 pounds of powder. The 12-inch rifle weighs 128,719 pounds and fires a 1000-pound projectile with 487 pounds of powder. These guns are mounted on barbette carriages. The barbette carriages are non-disappearing and disappearing. The 12-inch breech-loading rifled mortar weighs 29,000 pounds and fires a 1000-pound projectile with 105 pounds of powder. The illustration shows in detail a typical gun and mortar for coast defense as used in the United States service. Other illustrations, including one of a United States disappearing gun, will be found in the article ORDNANCE.

The 16-inch breech-loading rifle of the United States system is one of the largest guns ever constructed. The Italian 17.7-inch, the French 16.5-inch, and the Armstrong 16.25-inch guns,

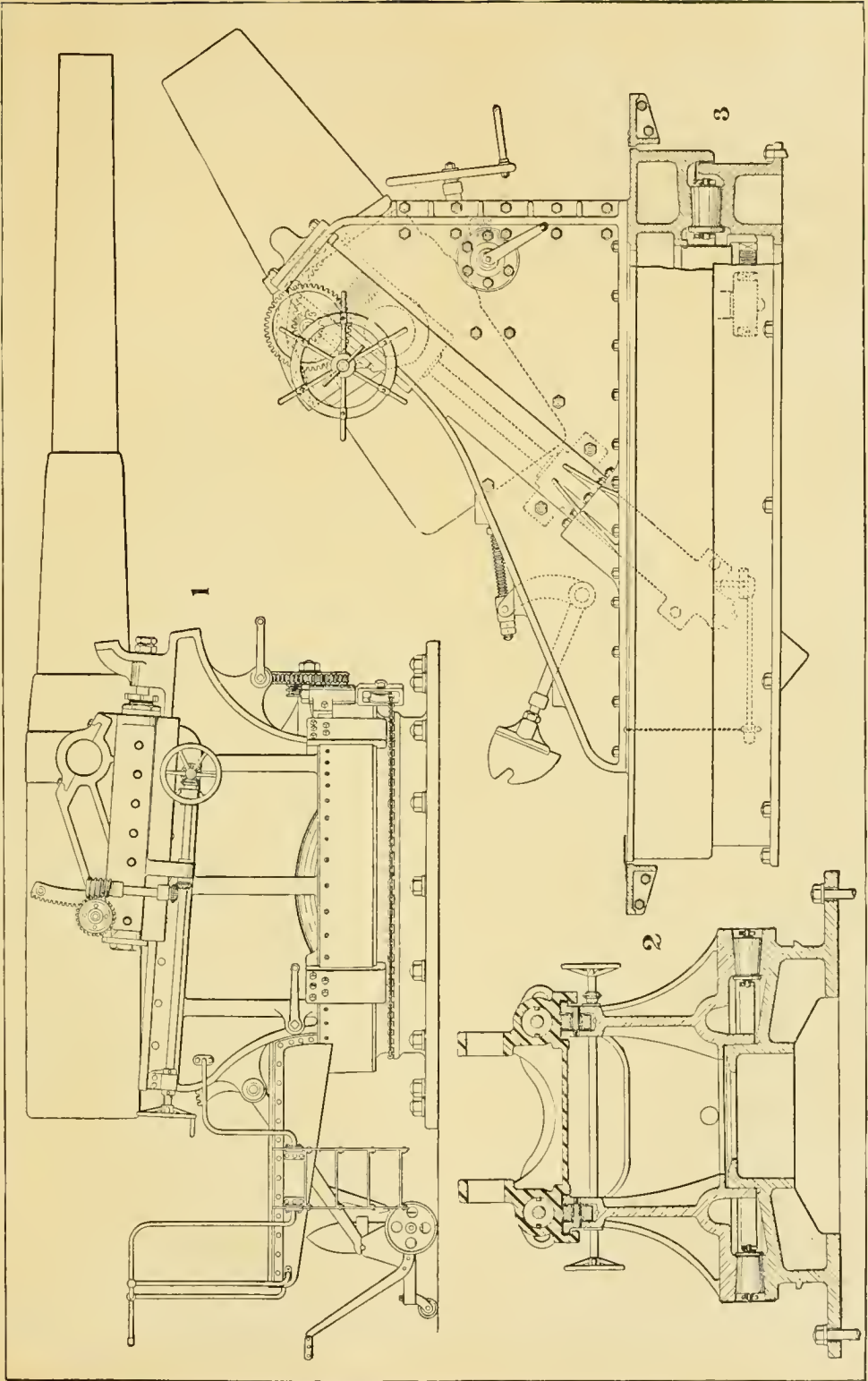
do not compare in point of energy and range with the recent American gun. With smokeless powder the gun requires a charge of 576 pounds (of the old black powder 1176 pounds would be needed) and fires a projectile 5 feet 4 inches long, weighing 2400 pounds, with a muzzle velocity of 2300 feet per second, developing a muzzle energy of 88,000 foot-tons, which gives a penetration of 42.3 inches of steel at the muzzle. These figures will be considerably increased when a suitable slow-burning powder is secured, but even now the gun shows an enormous superiority to any of the large guns mentioned above. The Italian gun, for instance, with a projectile weighing 2000 pounds and a muzzle velocity of 1700 foot-seconds (feet per second), develops only 40,000 foot-tons muzzle energy, not half that of the American gun. The French gun projectile weighs 1700 pounds, and with 1700 foot-seconds muzzle velocity, develops a maximum muzzle energy of only 36,000 foot-tons, while the English gun projectile of 1800 pounds, with a muzzle velocity of 2100 foot-seconds, gives a muzzle energy of 51,000 foot-tons. It is seen, therefore, that the maximum energy of the Italian gun is 45 per cent., that of the French gun 41 per cent., and that of the English gun 65 per cent. that of the United States gun. The maximum range of this enormous gun is 20.978 miles, the projectile reaching a height of 30,516 feet in this flight. The total length of the gun is 49 feet 2.9 inches; its weight about 130 tons.

England uses both breech and muzzle-loading cannon in her coast defense. Her largest guns are the four 100-ton guns at Malta and Gibraltar. Probably the most powerful gun in the English system is the wire-wound 12-inch breech-loading rifle, Mark VIII., which is 37 feet 1 inch long, weighs 46 tons, and fires an 850-pound projectile, with a muzzle velocity of 2367 foot-seconds. The coast artillery guns are the rifled muzzle-loading 64-pounders, 80-pounders, 7, 9, 10, 10.4, 11, 12, 12.5, 16, and 17.72 inch guns. The breech-loading, 4, 5, 6, 8, 9.2, 10, 13.5 inch and 32-pounder smooth bore. In all, England has 920 guns of various types mounted in her seacoast forts.

Coast defense in France is intrusted to 17 batteries, each including 4 officers, 129 men, and 4 horses, four of which are at the different rendezvous for the fleet. The guns actually mounted along the coast are of about 12 types, varying from a 58-ton, 34-cm. (13.8 inches) gun, firing a projectile of 924 pounds with a 440-pound charge of powder, giving a muzzle velocity of 2450 foot-seconds, to the 8-ton, 19-cm. (7.48) gun, firing a projectile weighing 165 pounds, with a 35-pound charge of powder, and giving a muzzle velocity of 1410 foot-seconds.

Italy's fortress artillery has various arms, from 45-cm. guns (18.1-inch) weighing 101 tons and firing a 2200-pound projectile, formerly supposed to be the most powerful gun in the world, down to Nordenfeldts and double-barreled mitrailleurs. In Belgium there are two brigades of fortress artillery having 58 active and 12 other batteries. The fortress artillery in Russia has a variety of guns, which include the following: 4.2-inch steel guns, 6-inch, 8-inch, 14-inch, 11-inch, 10-inch, the 10-barreled Gatling, and the 8-barreled Maxim automatic machine gun.

A description of the various guns and mortars



1. EIGHT INCH BREECH-LOADING RIFLE ON BARBETTE CARRIAGE.
2. END VIEW OF CARRIAGE.
3. TWELVE INCH BREECH-LOADING RIFLED MORTAR ON SPRING RETURN CARRIAGE.

used in the United States will be found in a publication of the War Department, *Modern Guns and Mortars* (Washington, 1895), which was prepared for the instruction of artillery gunners. Consult, also, Bruff, *Ordnance and Gunnery* (New York, 1900), and *Drill Regulations for Coast Artillery United States Army*, which are published from time to time by the War Department.

The construction of coast artillery and other cannon, together with their carriages or mounts, is described and illustrated under **ORDNANCE**, which should be read in connection with this article, while the historical development of coast artillery as well as of cannon of all forms is discussed under **ARTILLERY**. The use of coast artillery as a means of defense is treated under the title **COAST DEFENSE**, where the tactics of coast artillery are described. The forts and other defenses in which coast guns are mounted are discussed in the article **FORTIFICATION**.

COAST DEFENSE. The defense of a sea-coast involves the principles of both strategy and tactics. In considering the principles of strategy applicable to coast fortification it is essential to take into account the navy as our first line of defense. Every nation possessing a coast line has commercial interests, to protect which she requires a navy. Her fleet, whatever its strength, will require points of support on the home coast, to serve as a basis of operation in attack or defense. These points of support contain all the material necessary for building or equipping ships; they furnish all the needed men and supplies to the navy, and must offer for a beaten fleet, or one which on the outbreak of war has not yet completed its equipment, a safe harbor to repair damages or complete equipment. The material of a navy is very expensive and is difficult or impossible to secure after war has begun; consequently, the greater part must be prepared in time of peace and collected at the points of support, for which purpose extensive depots, magazines, and other constructions must be erected. To prevent all these constructions from being demolished at one blow, and to guard the fleet, while still taking in supplies or completing its equipment, against surprise, these points of support must be protected by suitable means, and this is the purpose of fortifications.

The only points of a coast that fulfill the conditions imposed by these considerations are the larger harbors (always bays and mouths of rivers), and they must be fortified not only against attack by sea, but also against land attack, for the late war between Japan and China showed conclusively that important naval ports (Port Arthur and Wei-hai-wei, for example) may be taken by forces landed on the coast without risking an attack on them by sea.

In applying the principles of land tactics to the selection of sites for, and the construction of, sea-coast forts, some modifications must be introduced, due to the fact that the enemy in the latter case is confined to the navigable channels, so that all his possible flanking attempts can be foreseen and provided against. The principles of tactics which find application here are: (1) To obstruct the enemy's advance, while leaving free that of the forces of the defense for offensive movements; in other words, so to obstruct the water approaches against the enemy as to leave free entrance and exit for the defending fleet. (2) To

be superior to the enemy at the point of attack; that is, to bring to bear on the channels of approach a heavier fire of high-power guns and howitzers and mortars than any fleet able to operate there can bring to bear on the defenses. (3) To place the isolated units for most effective action so as to be mutually supporting; this is accomplished by scattering the forts to prevent the enemy from concentrating his fire, at the same time arranging them so that fire can be concentrated on him. (4) To protect well the flanks of the position and compel the enemy, if he attacks at all, to make a direct frontal attack. This is done by closing all unnecessary channels, by protecting the obstructions by means of rapid-firing guns and the operators by means of bombproofs, and at night by illuminating the obstructed field with search-lights. (5) To provide means for offensive returns against countermine operations, either by means of a swarm of torpedo-boats, or by batteries for operating movable torpedoes from the shore.

There are two systems of guns in use in coast artillery: the flat trajectory, high-power guns, designed to pierce the side armor of battle-ships, and the high angle pieces (howitzers or mortars) whose projectiles are designed to fall on the decks. Both are necessary, and each has its proper sphere of action, the former having by far the greater accuracy, and the latter attacking the battle-ship at its weakest point. In Europe howitzers are generally preferred; but the recent tests of mortars near Portland, Maine, have proved the greater value of the latter. The calibre of the fort guns must be at least equal to that which the depth of water in the channel will enable the enemy to bring against the defenses and sufficient to pierce his armor at the outer mine field, or at about two-mile range. The greatest thickness of Kruppized steel used in the latest battle-ships is about 12 inches at the belt, and to penetrate this at the required range will require a 10-inch gun. The average thickness of deck armor most in use at present is about 3 inches of hardened nickel steel, and to penetrate this a high-angle gun (howitzer or mortar) 12 inches in calibre will be required. These, then, are the maximum calibres required against battle-ships, but to prevent distant bombardment of cities, etc., there is a 12-inch rifle and for close ranges also an 8-inch rifle. Armored cruisers have from 5 to 6 inches of hardened nickel-steel armor, and to penetrate their armor within the mine field (where they first come seriously into play) will require a 5-inch or 6-inch rapid-fire gun. The smaller vessels have but little armor protection, but as they come into action at the outer mine field (about 3330 yards) the smaller calibre guns to fight them must have the necessary penetration at that range, consequently must be about 2.5 to 3 inches in calibre.

The number of guns of each calibre should be at least half of, and preferably equal to, those the enemy can bring to bear. The latter is determined by noting on the map the length of channel (within three miles of the fort considered) which the enemy's fleet can occupy, and allowing from five to ten ships to the mile. From the depth of channel the ships of the enemy which can go there can be determined, and from their armor and armament the kind and number of guns required. If the enemy's armament is not known, then in deep channels from 30 to 60 guns of 6-inch calibre and over must be allowed to the mile (Abbot).

The outer mine line is derived by the intersection of the curves representing the limit of armor-piercing ranges of the guns on either side of the entrance, so that these torpedoes are under the effective fire of all the guns in the harbor; the inner line is usually at the narrowest part of the entrance.

The battle tactics of coast defense comprise defense against blockade, bombardment, and attack by sea.

DEFENSE AGAINST BLOCKADE.

The object of a blockade is the isolation of the port concerned in order to close all commercial communication by way of the sea, and presupposes the defeat of the enemy's fleet, which may also be shut up in the port. The observation of the movements of a daring enemy thus shut in is one of the most difficult problems which fleets have to encounter, and history shows that it is almost impossible. "For example, in 1759, the French fleet succeeded in breaking through the blockade of Dunkirk without being observed by the English fleet consisting of 66 ships." "In 1805 Nelson was in continuous observation of the harbor of Toulon. In spite of this fact the French fleet succeeded in running out, returning again because of injuries at sea, again leaving the harbor and joining the Spanish fleet, the combined fleets then sailing for the West Indies. Only after their return was Nelson enabled to seize them." The defender will naturally resist the blockade as long as possible and try to fit his fleet for active service again as promptly as he can. His first duty, then, is to keep the blockading fleet as far out as possible, and this duty will fall to the coast artillery, which must be constantly prepared, the guns ready for immediate action, the stations and range-finders continually manned, and the search-lights constantly at work. The plentiful use of electric light as a fighting agent is a passive factor, but one of very high value. His next duty is to inflict as much damage as possible on the blockading fleet, and this duty falls to the fleet stationed in the harbor, which must at all times be ready for action, and single torpedo-boats should be sent out under cover of darkness, to attempt the destruction of the enemy's ships. When the defeated fleet is ready for sea again the coast artillery will open a heavy fire on the enemy's ships, and, aided by their own artillery fire, the home fleet will endeavor to break through. This will naturally lead to a purely naval engagement, which need not be further considered here.

DEFENSE AGAINST BOMBARDMENT.

Bombardments aim chiefly at the destruction of the naval establishments of a fort, such as the arsenals, docks, magazines, and ships of the fleet lying in the harbor, but also secondarily at the destruction of cities and establishments other than those purely naval, in order to produce a depressing effect on the people. Bombardments are applicable only under special circumstances and not against every harbor; indeed, the latter must be a true roadstead. But even then the fortifications and armament must be either weak or obsolete. From this fact, and because of the limited supply of ammunition carried by ships, a bombardment will but rarely be justified. If it is attempted, however, the attacking fleet will set aside a small portion of its artillery to attack the coast artillery, reserving the greater part to attack the establishments lying within the harbor.

The defender will attempt to hold the open sea as long as possible with his fleet, but when driven in he will assemble his ships in rear of the outer obstructions, or at least attempt to hold that line with his torpedo-boats. The coast artillery will endeavor to keep the enemy as far as possible from the harbor. The object being to prevent, if possible, a bombardment of the harbor or city, all guns should take part, and when the enemy's fleet approaches the proper range, high-angle fire, with deck-piercing shell, will be used. The gun-boats and coast defenders or monitors of the home fleet can materially assist the coast artillery by the fire of their guns, but they must be protected from the enemy's torpedo-boats by a number of destroyers. As in case of blockade, the guns must be kept constantly manned and ready for action, and at night the search-lights must be constantly at work. Should the enemy be forced to retire, the home fleet must advance to the attack. See BOMBARDMENT.

DEFENSE AGAINST ATTACK BY SEA.

In attacking a hostile coast a fleet may either direct its efforts against a fortified harbor, or attempt to take possession of unfortified coast regions. The problem for the defense, therefore, naturally resolves itself into the defense of fortified places, and the defense of unfortified coast regions. The phases of the attack by sea in the first case are, in order, the removal of the outer obstructions, the reconnaissance, the artillery duel, the removal of the inner obstructions, the forcing of the entrance, and, finally, landings to obtain full possession of the forts. The phases of the defense will correspond.

Before endeavoring to ascertain the position of the guns of the defender, the attacking fleet will seek to destroy outer obstructions, in order to get possession of the outer bay, and, if the opportunity should offer, to force the passage. The torpedoes of the mine fields and the guns of the batteries on shore are complementary means of defense, each inadequate without the other. The obstructions are a passive means, but only become real obstacles when protected by the coast artillery; on the other hand, the latter alone, without the obstructions, cannot prevent the enemy from entering the harbor. The outer mine field is so important that there will be a serious struggle over it, for, once the attacking fleet passes over it, its further work is greatly simplified.

The defender, therefore, must be constantly on the alert, especially at night, when the search-lights are continually in use lighting up the foreground beyond the mines. All approaching ships are fired upon by the artillery, and since the enemy will probably not attempt to remove the mines with any but his smaller vessels, such as torpedo-boats (since the outer mine field is placed intentionally in the field of greatest effect of the guns on shore, both vertical and horizontal), rapid-fire guns should be used, because these small vessels move rapidly, offer but a small target, and their work, by the time their purpose is known on shore, can be done promptly. Moreover, since the attack may be directed on several points of the mine field at the same time, it is best to assign the rapid-fire batteries to particular sectors of the mine field to insure prompt action on all the enemy's vessels. The torpedo-boats of the defense remain close up to the mine fields in order to fight the enemy's torpedo-boats while they are

endeavoring to remove the mines. The counter-attacking torpedo flotilla must be followed by one or two mine-laying ships, for repairing the damaged mine lines.

The attacker's object in reconnaissance is to obtain full and accurate knowledge of the location and power of the defender's guns of all calibres and kinds, the position of the torpedo batteries and mine observation stations, and finally to find out what new gun positions have been erected for the war. The defense, therefore, endeavors to veil all his batteries that cannot be readily seen from the sea, and to still further deceive the enemy he erects a number of small batteries. Batteries with disappearing carriages and mortar batteries have here a great tactical advantage, because they can be readily concealed. While the fleet is reconnoitring, therefore, beyond the outer mines, only such guns of the defense open fire as cannot be concealed, but as the ships come near the mines, and take up the formation in column, the other batteries open fire and with armor-piercing projectiles. Each battery is assigned to a different ship, on which it concentrates its fire, and which it follows until it is sunk or gets beyond armor-piercing range. The coast artillery is assisted in this work by the guns of the ships that may be in the harbor, these vessels moving inside the mine field on lines perpendicular to the enemy's line of advance, making the greatest possible use of their artillery, the torpedo-boats making counter-attacks when possible. The infantry garrison of the fortified place is posted on outpost along the shore, and prevents the enemy from landing reconnoitring parties, or fires on torpedo-boats sent along the shore to reconnoitre. In case the mine obstruction was removed by the enemy before his reconnaissance, the defender's larger vessels cannot take so advanced a position close up to the mine field, and as soon as the attacker approaches the latter the defender must bring all his guns into action.

The object of the artillery attack is to silence all coast forts and batteries commanding the harbor entrance, to put out of action all guns mounted in them, and to destroy all positions flanking the obstructions. It is the preparation for the final assault. The main strength of the defense in this phase of the action will be the coast artillery, and since the enemy, because of his limited supply of ammunition, will probably endeavor to gain the upper hand as rapidly as possible, this artillery will require an energetic, decisive, and rapid service, and should be assisted by the artillery fire of the ships of the defense that may be in the harbor. The targets to be attacked are mainly the large, heavy battle-ships, of which the vital parts are protected by powerful armor. The latter must be destroyed to put the ship out of action, and this is a task set for the heavy guns. The conduct of the coast artillery must be systematic, and hence the command of fortified places is under a fortress commander, under whom are the district commanders, and these again control the group of battery commanders and the search-light stations. The heavier armor of a battle-ship is on her belt, extending above and below the water-line, while the deck is but slightly protected. The large calibre, flat-trajectory guns are used for piercing the heavy side armor, and with the new United States explosive D (or another of equal value, Maximite), and the delay-action fuse of the Ordnance

Department, the destructive effect is expected to be enormous. Howitzer or mortar shells are used for piercing deck armor; rapid-fire guns for firing on unprotected parts and clearing decks and tops.

The naval battle of Santiago clearly illustrated the value of a good artillery, and if such a magnificent action is possible from aboard ship, a far more favorable effect is to be expected from the land. But this battle also shows how dangerous it is to neglect all preparations on the part of the coast artillery, and the Spanish coast artillery must bear a large portion of the blame for the sacrifice of Cervera's fleet. Special attention must be paid to the equipment of the observation stations of the district artillery commanders. Good telescopes and photographs and plans of the enemy's ships must be on hand for immediate use, to enable them to recognize the different ships, and in the group and battery commanders' stations there must be more detailed plans of the ships to determine the projectiles to be used at various ranges. Works are now published giving, in silhouette, the appearance (to the naked eye, at a particular distance) of every important war-ship.

The inner obstructions consist of lines of mines, sea barricades, and occasionally also of a submarine dike. The decisive engagement for the possession of the harbor will be fought at this barrier, for which reason it is protected by numerous rapid-fire and torpedo batteries. The reconnaissance of the inner obstructions, and even their partial removal, may be attempted by the enemy during the artillery duel, hence the defender must make constant use of his search-lights to detect such a move. The assailant will first attempt to destroy the inner obstructions by means of torpedo-boats, then he will try to break them up by artillery fire, and finally he may attempt to land detachments at night to blow them up, or send a drifting mine-destroyer against them. The inner mines are usually within the effective armor-piercing range of the heavy guns, as well as under the fire of the rapid-fire batteries; the former act against the armored ships, the latter against the small and fast torpedo-boats or unarmored vessels.

The forcing of the entrance is the closing act of the assailant's undertaking, and its object is the final occupation of the disputed harbor. At the head of the final assault are torpedo-boats which, acting as a patrol, make a final attempt to break through the obstructions. These, as well as the torpedo flotilla following them, should be greeted with a hail of projectiles from the rapid-fire guns of the shore batteries. All other coast guns and howitzers should be directed against the battle-ships of the attacking fleet, and should fire especially at the leading ship. As the attacking vessels enter the harbor the fire of the coast guns is concentrated more and more against the vessels following. This artillery battle is continued until each fort in succession is taken by the enemy. The home fleet inclosed in the harbor should now attempt to break through the lines at all hazards, and this can best be done at night. Unfortified coast regions are subjected to attack by the enemy's fleet, the purpose being either to support the operations of a land army, or to attack a fortified harbor from the land side.

Military history proves that it is by no means easy to capture a well-defended harbor by the

means at the disposal of a fleet. The success of Farragut in the Civil War appears to contradict this statement, but it must be remembered that the condition of the navy on the one hand, and that of the coast artillery on the other, were at that time more favorable for forcing a harbor than they are to-day. Nevertheless, on many occasions, Farragut himself, while attacking a seacoast, called for assistance from the artillery on the land side. Wars are so short nowadays, and decisive battles are sought so quickly in the interest of the countries concerned, that the cooperation of a strong land army is now deemed essential to support the naval attack; indeed, the land attack will generally be the principal one. This was shown to be the case in the China-Japanese War as well as in the Spanish-American War. The best protection of a seacoast of a country lies in the possession of a powerful navy, but should the latter meet with misfortune the coast must be protected to prevent landings. The defense of the unfortified portions of the coast will be intrusted to a special coast guard corps, strong enough to oppose the enemy at all points with superior forces. To determine what this strength should be, the landing of the Japanese for the purpose of attacking Wei-hai-wei furnishes some useful data. The army of 27,000 men was landed in thirty-six hours, consequently, with the better means available to-day, about 20,000 men can be landed in twenty-four hours, hence a coast defense corps of equal strength should be able to appear at the landing-place in that time, and considering the necessary detachments to be left at various points, it will take about 30,000 men to guard the coast between two fortified forts not over a day's cruise apart.

Consult Abbot, *Defense of the Seacoast of the United States* (New York, 1888); and Wisser, *Tactics of Coast Defense* (Kansas City, 1902). For a description of the ordnance used in modern coast defense, see COAST ARTILLERY and ORDNANCE, the historical side of the subject being treated under ARTILLERY. The article on FORTIFICATION discusses the history and construction of coast defenses, together with the scheme adopted for the defense of the coast of the United States, and should be read in this connection.

COAST GUARD. The coast-guard service of Great Britain was originally established as a means of revenue protection, but was reorganized and transferred to the Admiralty in 1856. It now partakes of the character of a naval reserve, life-saving, and signal service in addition to its duties in connection with the customs. It is under the control of the Admiral Superintendent of Naval Reserves, who has a captain in the navy as his assistant. The coasts of the United Kingdom are divided into nine districts—Hull, Harwich, Newhaven, Weymouth, Holyhead, Leith, Clyde, Limerick, and Kingstown—each presided over by the captain of the coast-guard station ship of the district, which vessels are usually old-type armored rams, though in 1901 two of them were protected cruisers. In addition there were (in 1901) eleven gunboat cruisers of 461 to 810 tons, seven small steam cruisers of 300 to 520 tons, five sailing cruisers (four yawls, one cutter) of 120 to 131 tons, five sailing cruisers (cutters) of 70 tons, and seven sailing cruisers (cutters) of 70 to 60 tons. The districts are subdivided into 81 divisions in charge of inspecting officers consisting at present of 32 commanders, 36 lieutenants, and

the remainder of subordinate coast-guard officers. The divisions are divided into 238 stations, each in charge of a chief officer who is about equal in rank to a warrant officer. The coast between stations is patrolled at all times, day and night, and means of signaling to vessels is kept ready for instant service. The regulations of entry vary from time to time, but the men are all good-conduct men who have completed a long term of service in the navy and are not above a certain age. According to the budget of 1901-02, the number of commissioned officers attached to the coast-guard service is 89, exclusive of officers regularly serving on board the vessels of the navy acting as station ships and gunboats. There are also 238 chief officers of stations and 3873 petty officers and seamen, making a total of 4200 persons.

COASTING. An outdoor winter game, supposedly of Russian origin. The sport consists of sliding down a slippery bank or other inclined grade of snow or ice, by means of a sled. (See TOBOGGANING.) The rider may make the trip either sitting, lying, or kneeling on one knee, each method having its own advantages, but the most general is that of sitting sidewise on the rear of the sled, and steering with one leg, which is trailed behind. Coasters are not supposed to utilize hills which are used for traffic, even supposing such a prohibition is not a matter of local law. For the various kinds of sled used, see SLED.

COASTING TRADE. The commerce carried on by sea between the different ports of the same country. In Great Britain, 'coastwise' is defined to mean 'from any one part of the United Kingdom to any other part thereof.' Vessels engaged in this commerce are subject to different rates and regulations from over-sea traders, and the masters must keep their books showing that their cargoes come strictly within the definition of coasting trade. Formerly, no goods or passengers were allowed to be carried from one port of the United Kingdom to another except in British vessels; but this restriction was repealed in 1854, and the coasting trade in Great Britain is now open to all the world, though the share of foreign nations is inconsiderable. This is seen in the fact that in 1898 the shipping cleared from British ports to other British ports amounted to 30,504,091 tons, but of this only 134,551 was foreign shipping.

Owing to the length of coast, this trade in the United States is far more extensive than in any other country. Of the forty-nine States and Territories (exclusive of Alaska), eighteen border on the Atlantic Ocean and the Gulf of Mexico, and three border on the Pacific Ocean, to which may be added the enormous coast-line of Alaska, Hawaii, and Porto Rico. The extensive commerce of the Great Lakes is also included in the coasting trade. In the time of the early settlements such trading was done in small shallops, sloops, and schooners, and there was very little of it. This trade is restricted to American vessels, and with the growth of the country in population the trade has grown enormously. At the present time many hundreds of steamers and many more hundreds of sailing craft are constantly plying from Maine to Texas, transferring the cotton, sugar, and rice of the South to Northern, and the lumber, grain, and manufactured goods of the North to Southern markets. The swift propeller brings the oranges and strawberries of Florida to Maine, and takes

back the ice of the Penobscot. In summer these coasting steamers do a large share of the passenger as well as trade traffic. The thoroughness of the coast survey, and the introduction of the weather service whereby mariners are duly forewarned of danger, have done much to prevent the disasters which were common not long ago, and even the dreaded Cape Hatteras has lost much of its terror. There are no records of the volume of business which is done in the coasting trade, but the fact that the licensed tonnage in the coasting trade and fisheries grew from 3,160,917 tons in 1860 to 4,338,145 in 1900, coupled with the fact that the tonnage of steam vessels increased from 770,641 tons in 1860 to 2,289,825 tons in 1900, attests its growth. Moreover, the fact that 816,795 tons of American shipping registered in 1900 in the foreign trade were represented by 4,006,114 tons in the statistics of tonnage cleared, gives us by way of comparison some idea of the enormous business which must be done in the coasting trade. The reports of the United States Commission of Navigation contain a wealth of material relating to all shipping questions.

COAST LINE. See SHORE.

COAST PILOT. A pilot licensed to conduct vessels from one part of the coast to another. He is expected to be familiar with all bnoys, beacons, lighthouses, and other aids to navigation along the part of the coast for which he pilots, and to have such a knowledge of the soundings, currents, weather, etc., as to enable him to conduct safely a vessel in thick or bad weather or at night. Upon reaching the entrance to a port the local pilots take charge of the vessel. The term is also applied to a series of volumes published by the United States Coast and Geodetic Survey, which give information in regard to the coast of the United States in great detail.

COAST RANGE. The system of uplifts which extends along the Pacific Coast with interruptions from southern California to the Strait of Juan de Fuca in Washington (Map: California, B 1). The name is also given to the range of mountains that defines the coast line of British Columbia and which is flanked by the Island Range on the west and merges into the Cascades toward the east. The Coast Range of the United States has its beginning in the San Jacinto Range of southern California. Thence the line of elevations is continued in a general northwesterly direction by the Santa Ana, San Bernardino, San Gabriel, and Sierra Madre ranges, and by the San Rafael Range, the last being joined by a spur of the Sierra Nevadas lying to the east. From this point (about latitude 35° N.) northwest to the Bay of San Francisco there are two well-defined ranges, the one known locally as the 'Coast Range' rising abruptly from the shore line, and the other (Monte Diablo) paralleling the coast but lying some fifty miles inland. Both ranges are interrupted by the indented trough of San Francisco Bay.

Throughout northern California the Coast Range is formed by more or less disconnected mountain groups, which near the Oregon boundary diverge to the east and connect with the Cascade Range. Further north, in Oregon and Washington, the uplifts are less marked, the elevations averaging only from 1000 to 3000 feet.

The Olympic Mountains, however, near the Strait of Juan de Fuca in Washington, include several peaks of considerable elevation, the highest being Mount Olympus, with an altitude of 8150 feet. The culminating points of the Coast Range are found in southern California, where are located San Bernardino Mountain, 11,600 feet; San Jacinto Mountain, 10,987; Tehachipi Peak, 9214, and Mount Pinos, 9214. In central and northern California, the extreme elevations are attained in Mount Diablo, 3849 feet, and Inaqua Buttes, 3580 feet. Except in southern California, the Coast Range presents no marked barrier to the drainage of the coastal region. This is due both to the interrupted character of the range and to its low altitude. The principal rivers crossing it are the Chehalis, Columbia, Umpqua, Rogue, Klamath, Eel, Sacramento, and Santa Maria. The Salinas River occupies the valley between the parallel ranges of southern California and flows into the Bay of Monterey. See topography of CALIFORNIA, OREGON, WASHINGTON; and for Coast Range of British Columbia see topography of BRITISH COLUMBIA.

COAST-RANGE TROUT. A local name in California for the rainbow trout (q.v.).

COATBRIDGE, kōt'brīj. A prominent and prosperous town of Lanarkshire, Scotland, nine miles east of Glasgow (Map: Scotland, D 4). The town is in the centre of a mineral district, and contains malleable-iron works, and many other works connected with the iron industry. Owing to the great increase in the iron trade, Coatbridge has grown rapidly in size and prosperity. Population, in 1841, 1599; in 1901, 36,981.

COATESVILLE. A borough in Chester County, Pa., 39 miles west of Philadelphia; on the Pennsylvania and the Philadelphia and Reading railroads. It contains a fine Y. M. C. A. building, and is noted as an industrial centre, the establishments including iron and steel-works, steel-plate mills, boiler-works, brass and iron foundries, silk-mills, etc. Settled about 1800, Coatesville was incorporated in 1867. The government is vested in a burgess, elected every three years, and a borough council chosen on a general ticket. There are municipal water-works. Population, in 1890, 3680; in 1900, 5721.

COATI, kō-ā'tē, or COATI-MONDI. The native Brazilian name of certain tropical raccoons of the genus *Nasua*. They are not unlike the typical raccoons in many of their characteristics, but the body is more elongated. They are from two to three feet long, and are chiefly remarkable for the elongation of the snout, which is a sort of flexible proboscis, and is used in search of food, and in rooting up the earth to obtain worms and insects. They are often domesticated in South America, and are very affectionate, active, troublesome, and amusing. They are arboreal in their habits, and besides insects, eat birds and their eggs. Only two species are known, the Mexican coati (*Nasua narica*) and the Brazilian red coati (*Nasua rufa*). The former is brownish-gray and is found from Panama northward to southern Mexico. The other is reddish-brown and occurs throughout South America east of the Andes. Consult: *Pop. Science Monthly*, vol. ii. (New York, 1872); *American Naturalist*, vol. x. (Boston, 1877); *Proc.*

U. S. National Museum (Washington, 1899). See Plate of MINOR CARNIVORES.

COATICOOK, kô-ät'î-kuk. A town and port of entry in Stanstead County, Quebec, Canada, on the Coaticook River and the Grand Trunk Railway, 120 miles southwest of Quebec (Map: Quebec, E 5). It is a manufacturing and industrial centre and has a United States consulate. Population, in 1891, 3086; in 1901, 2880.

COAT OF ARMS. As understood in heraldry, at the present day, a relic of the ancient armorial insignia which were formerly embroidered upon a coat or vest worn over the armor, to render a knight conspicuous in battle. See HERALDRY.

COAT OF ARMS, NATIONAL. The coats of arms whose use has obtained official sanction by modern national governments represent in most cases the family heraldic insignia of their sovereigns. As such their treatment falls most appropriately under Heraldry. See HERALDRY.

COAT OF MAIL. In the armor of the Middle Ages, a suit made of metal scales or rings, linked one within another. See ARMOR.

COATZACOALCOS, kô-ät'sá-kô-äl'kôs. A port in the State of Vera Cruz, Mexico, on the Gulf of Campeche, at the mouth of the Coatzacoalcos River, 170 miles northeast of Oaxaca (Map: Mexico, M 8). It is the residence of a United States consular agent. The exports consist chiefly of rubber and timber. Population, 3000.

COATZACOALCOS. A river of Mexico rising in the Sierra Madre, flowing most of the distance across the Isthmus of Tehuantepec, and emptying into the Gulf of Mexico (Map: Mexico, M 9). One of the possible routes for a trans-isthmian canal is partly along its course. It has a length of about 150 miles and is navigable for a short distance from its mouth.

COB. OLIVER. A character in Ben Jonson's *Every Man in His Humour*, one of the water-carriers who distributed water in London before the city had its public water-supply.

COBALT (Ger. *Kobalt*; possibly the same as *Kobold*, goblin). A metallic element discovered by Brandt in 1735. The word cobalt is found in the works of Paracelsus and other early writers, and was used to designate minerals that suggested the appearance of metallic ores, but when smelted failed to yield any metal; hence, the name 'cobalt,' signifying *sprite*, was given to such minerals on account of the illusive character of their metallic constituents. It was also applied to certain blue pigments containing cobalt as far back as the times of the Greeks, but it was not until Brandt investigated the blue coloring of smalt that the elementary character of the metal was established. The element is found free only in meteorites, but it usually occurs in nature with arsenic or sulphur, and with nickel and other metals, as *smaltite*, a cobalt diarsenide; as *skutterudite*, a cobalt triarsenide; as *cobaltite*, a cobalt sulpharsenide; as *asbolite*, a wad containing oxide of cobalt; and as the earthy minerals *noumcite* from New Caledonia, and *garnierite* from Oregon. The metal itself may be prepared by igniting the oxalate, when the carbon and oxygen pass off, leaving the cobalt behind.

Cobalt (symbol Co, atomic weight 59) is a

steel-gray lustrous crystalline metal that is nearly white when polished, somewhat malleable, ductile at a red heat, and highly magnetic, with a specific gravity of 8.5 to 8.9. It melts at 1500° C. The metal has no uses by itself, although it forms alloys with copper, iron, and manganese, and it may be deposited on metals by electroplating as a fine, lustrous coating, which is said to be harder, more tenacious, and of greater beauty than that obtained with nickel. Cobalt combines with oxygen to form a monoxide or cobaltous oxide, and a sesquioxide or cobaltic oxide. Its principal commercial salts are pigments. Of these the most important is the *cobalto-cobaltic* oxide, which is a mixture of both oxides, corresponding in character to the magnetic oxide of iron. This is obtained commercially from the ores of cobalt and from *speiss* in the separation of nickel; in the latter case the *speiss* is fused with fluor-spar and chalk so as to yield a richer matt containing less iron; the matt is ground and oxidized by thorough roasting, which also serves to expel arsenic and sulphur; it is then dissolved in hydrochloric acid and diluted with water. From this solution cobalt oxide is precipitated by the addition of bleaching-powder. This oxide is used for the preparation of various salts of cobalt and for making the smalt employed by enamellers and potters for the production of the finest blue glaze on porcelain. When heated with alumina it yields a fine blue pigment which is called variously *cobalt blue*, *cobalt ultramarine*, and *Thénard's blue*; and when heated with zinc oxide it yields the pigment called *cobalt green* or *Rimann's green*. *Smalt* is a permanent blue pigment consisting essentially of cobalt silicate and potash; it is also called *bleu d'azur* and *bleu de saxe*. *Zaffre* is an impure oxide obtained by roasting cobalt ore and mixing with several parts of coarse sand. During 1899, 10,230 pounds of cobalt oxide were mined in the United States, having a value of \$18,512.

COBALTITE. A mineral cobalt sulpharsenide, whose composition is CoAsS. It crystallizes in the isometric system, has a metallic lustre, and is silver-white, tending to red, in color. It occurs in association with other metallic sulphides, especially those of lead and silver, and is found in Sweden, where excellent crystals are known; also in Norway, and at various localities in Silesia, but not in the United States to any extent. It has occasionally been cut as a gem, and then resembles a flesh-colored pyrite. When present in sufficient quantities it is a valuable ore of cobalt.

COBÁN. kô-bän'. The capital of the Department of Alta Verapaz, Guatemala, on the Rio Cojabón, about 90 miles north of the city of Guatemala (Map: Central America, B 3). It is picturesquely situated on the slopes of a hill, and is irregularly built. Its modern buildings are of some merit. The town has minor manufactures, and is the centre of a fertile district producing coffee, cacao, vanilla, and sugar-cane. Population, in 1900, 24,475.

COBB, HENRY IVES (1859—). An American architect. He was born in Brookline, Mass., and was educated at the Massachusetts Institute of Technology and at Harvard, where he graduated in 1880. He has been architect of numerous public buildings, notably in Chicago. Among

these are the Opera House, the Newberry Library, and the Church of the Atonement. In 1893 he was one of the National Board of Architects for the World's Columbian Exposition buildings, and afterwards was retained as special architect by the United States Government.

COBB, HOWELL (1815-68). An American politician. He was born in Jefferson County, Georgia, graduated at Franklin College in 1834, and was admitted to the bar in 1836. From 1837 to 1840 he was Solicitor-General of his State, and from 1843 to 1851 was a member of Congress. In 1849, after a long and bitter contest, he was elected Speaker of the House. He was one of the leaders of the Southern Party in Congress, and favored the extension of slavery into the territory acquired from Mexico. He was chosen Governor of Georgia in 1851, and was again sent to Congress in 1855. He was Secretary of the Treasury in Buchanan's Cabinet, but resigned in 1860 to join the South in the approaching war. He was the president of the congress that drafted and adopted the Confederate Constitution, but antagonism to Jefferson Davis compelled his retirement from the Secession Administration. He was appointed major-general in the Southern Army, but did not take part in any considerable military operations. After the declaration of peace he bitterly opposed the reconstruction policy of the Federal Government.

COBB, SYLVANUS (1799-1866). An American minister of the Universalist Church, born at Norway, Maine. He edited *The Christian Freeman* for twenty years and published *The New Testament, with Explanatory Notes* (1864); *A Compend of Divinity, and Discussions*. He was prominent in anti-slavery and temperance movements. His name is more widely known through the writings of his son SYLVANUS (1823-87), a prolific and very popular writer of tales and sketches of adventure, who published also the *Memoir* accompanying his father's *Autobiography* (Boston, 1867).

COBB, THOMAS REED ROOT (1823-62). An American lawyer and author. He was born at Cherry Hill, Ga., graduated in 1841 at the University of Georgia, and from 1849 to 1857 was a reporter of the State Supreme Court. During a part of the Civil War he served in the Confederate Congress, where for a time he was chairman of the Committee on Military Affairs. He afterwards became a general in the Confederate Army and fell at Fredericksburg. He published *Digest of the Laws of Georgia* (1851); *Inquiry into the Law of Negro Slavery in the United States* (1858); and *Historical Sketch of Slavery, from the Earliest Periods* (1859).

COBBE, KÖB, FRANCES POWER (1822-1904). An English philanthropist and author. She was born in Dublin in 1822, and was the great-granddaughter of Charles Cobbe, Archbishop of Dublin. Though brought up in an atmosphere of evangelical piety and sent to a fashionable boarding-school, which proved to be torture to her vigorous, independent spirit, yet her early study of theological, ethical, and religious subjects finally brought her to the acceptance of the doctrines of theism. In 1857, after a year of travel in Italy, she joined Mary Carpenter at Bristol in conducting schools and reformatories for girls. She contributed articles to *Macmillan's* and other magazines and weeklies, and, be-

ginning in 1867, was for seven years an editorial writer for the *Echo*, a London daily. Later she wrote for the *Standard*. During this period her special subjects were the suffrage and property rights for women, and vivisection. She was long one of the foremost opponents of vivisection in England, and, when the columns of the newspapers were closed to her for the discussion of this subject, she established a monthly periodical for that purpose. Her published works make a long list. They are all characterized by a remarkably fluent and forcible style. Among them are *Intuitive Morals* (1855); *Broken Nights* (1864); *Darwinism in Morals* (1872); *Hopes of the Human Race* (1874); *Duties of Women* (1880); *The Scientific Spirit of the Age* (1888); *The Modern Raek: Papers on Vivisection* (1889); and a charming *Autobiography* (2 vols., London, 1894).

COB'BETT, WILLIAM (1762-1835). An English political writer. He was born March 9, 1762, at Farnham, Surrey, where his father, a peasant farmer, trained him in habits of industry and self-dependence. He took a dislike to rural occupations, and at sixteen years of age went to London, where he was employed as a copying clerk; but, this becoming distasteful, he enlisted in the Fifty-fourth Regiment of infantry, which shortly afterwards went to Nova Scotia. He remained in the regiment eight years, and by good conduct, activity, and intelligence became sergeant-major. During this period he devoted his leisure to self-education. On his return to England in 1791 he obtained his discharge through the kind offices of Lord Edward Fitzgerald, married, and later went to France, where he learned the language. In the following year he went to America, and, failing in an attempt to obtain a Government position, supported himself for a time at Wilmington, Del., teaching English to French emigrants, Talleyrand being one of his pupils. He settled in Philadelphia and became a political writer. Under the signature of 'Peter Poreupine' he was as keen a Tory as in later life he was a Radical, and, being stung by disparaging criticism of his mother country, he lashed American democracy and French republicanism with coarse, bitter, and personal scorn. Twice prosecuted for libel, he left America in June, 1800, and returned to England, where, in January, 1802, he started his famous *Weekly Political Register*, which continued uninterruptedly until his death. At first Tory, the *Register* gradually changed its politics and became the determined opponent of the Government and the uncompromising champion of Radicalism. Having previously been found guilty twice of libel on certain members of the Government, he was in 1810 fined £1000 and sentenced to two years' imprisonment in Newgate for his severe comments in the *Register* upon the flogging of five militiamen by Hessian mercenaries. In sore financial straits, and again in danger of imprisonment for free speech, Cobbett returned to America in 1817, and for two years farmed on Long Island, transmitting his articles for the *Register* with unflinching regularity. On his return to England in 1820, his strange whim of transporting the bones and relics of Thomas Paine, whom he had formerly reviled and now fulsomely eulogized, met with contempt and ridicule. He established a seed farm at Kensington, and for some years engaged in agriculture. In 1829-30 he traversed England and

Scotland on horseback, delivering political lectures in the principal towns, and he was received everywhere with enthusiasm as the most powerful advocate of the people's rights. In 1832 he was returned to the first Reform Parliament as member for Oldham. His first speeches did not add to his reputation, but caused amusement, Peel blandly informing him that they would receive the attention due to any 'respectable member,' but he eventually gained a respectful hearing. He was engaged in a debate on the malt tax just before his death at Normandy Farm, near Guildford, June 18, 1835. Cobbett was the compiler of the *Parliamentary History* (London, 1806), which after 1812 was published as Hansard's *Debates*, and originated Howell's *State Trials* (London, 1809-28). Among his best-known works are his *Grammar of the English Language* (1819); *Rural Rides* (1830); *Cottage Economy* (1822); and *Advice to Young Men and Women* (1829). His *History of the Protestant Reformation* (2 parts, 1824-27) attacks the Reformers, defends Roman Catholicism, and, often translated, has been extensively circulated in France and Italy. His sons published an annotated abridgment of his political works (9 vols., 1848). While not a man of the first order of intellect, and excluded from the higher refinements of thought, in matters of common sense Cobbett exhibited vigor far surpassing that of any other writer of his day. Despite crotchets, he rendered lasting service to the cause of the people. Consult: His autobiographical *Life and Adventures of Peter Porcupine* (Philadelphia, 1798); E. Smith, *Life of Cobbett* (2 vols., London, 1878); Huish, *Life of Cobbett* (London, 1836); Waters, *Cobbett and His Grammar* (New York, 1883); Watson, *Biographies of Wilkes and Cobbett* (London, 1870).

COBBLER, or COBBLER-FISH. (1) See KILLIFISH. (2) See THREADFISH.

COBBLER OF PRESTON, THE. A musical burlesque by Charles Johnson, produced in 1716 and altered a century later. Its plot was suggested by the adventures of Christopher Sly in Shakespeare's *Taming of the Shrew*.

COB'BOLD, THOMAS SPENCER (1828-86). An English scientist, born at Ipswich. He studied anatomy under Crosse and later took the regular medical course at the University of Edinburgh. In 1857 he went to London, and from 1857 to 1861 he lectured on botany at Saint Mary's Hospital. In 1861 he began his lectures at the Middlesex Hospital, and subsequently, while practicing medicine, also lectured on geology at the British Museum. In 1873 he was made professor of botany and later acted as professor of helminthology at the Royal Veterinary College. Although he was a scientist in the broadest sense of the term, his investigations were chiefly in the field of helminthology—the science of parasites; and his published works deal chiefly with subjects of this science. His writings include: *Entozoa: An Introduction to the Study of Helminthology, with Reference More Particularly to the Internal Parasites of Man* (1864, and supplement, 1869); *Tapeworms* (1866, and several subsequent editions); *Worms* (1872); *Parasites* (1879); *Human Parasites* (1882); *Parasites of Meat and Prepared Flesh Foods* (1884); also a large number of original memoirs published in various scientific periodicals.

COB'DEN, RICHARD (1804-65). An English statesman and economist known as the Apostle of Free Trade. He was born in the hamlet of Ileyshott, near Midhurst, in Sussex, on June 3, 1804, of a family which for centuries had been settled in the place. His father was a sweet-natured, incapable man, who proved unequal to the task of supporting his family. In 1814 the farm was sold and young Cobden was sent off to be educated at a Yorkshire school, where he learned nothing and suffered much for five unhappy years. In 1819 he entered his uncle's warehouse in Old Change, London, and devoted himself with great energy to his new business, finding time, nevertheless, at nights, for study and reading. At twenty-one he was a commercial traveler for his uncle's house, and loved the business for the opportunities it gave him of studying men and things. In 1828 he set up as the commission agent of a large manufacturing house in Manchester on a capital consisting mainly of energy, ability, and his good name. In 1831 he and his partners had prospered sufficiently to start in business for themselves as calico-printers at Sabden, near Clitheroe, and in the following year branches were established in London and Manchester. The 'Cobden prints,' tasteful and original in design, became famous, and the partners were speedily on the way to the accumulation of a large fortune. In 1832 Cobden settled in Manchester, and from that time his private affairs became secondary to the interest which he displayed in the broad practical principles of economics and public education. From 1832 to 1835 he must have been busy educating himself, for this was the only time during his early life when he could have found the leisure to acquire the profound knowledge of political history and economics for which he was distinguished. Reading and foreign travel continued to the last to be a great passion of his life.

In 1835 Cobden published a pamphlet entitled *England, Ireland, and America, 'by a Manchester Manufacturer,'* and this was followed in 1836 by another pamphlet on *Russia*. These two pamphlets were epoch-making, in that they boldly challenged the prevalent ideas of foreign policy and foreign trade in England. It would seem that the sober-minded Cobden, an enthusiast in his way, had become convinced that commerce was the great torch-bearer of civilization and the great foundation of national prosperity. Anything, therefore, which interfered with the free exchange of commodities between nation and nation was harmful, and for this reason protection, which dammed the current of trade, and war, which sought entirely to destroy it, were pernicious. He attacked the historical English policy of intervention in European affairs, on the ground that it bred interminable wars in Europe, while it crushed the English taxpayer with the burden of an enormous debt. The balance of power, the political ideal for which so many sanguinary contests had been fought, Cobden ridiculed as an impossible adjustment which, in spite of centuries of bloodshed and diplomacy, still left statesmen facing an obstinate, unstable equilibrium. He strongly deprecated, too, the prevailing spirit of hatred for Russia, the great bugbear of English statesmen. Summed up, his plea was for the principles of peace, non-intervention, and a policy of retrenchment and

free trade as a means of husbanding the national resources for the great economic struggle that was fast approaching with the entrance of the United States into the markets of the world. In 1835 he made a brief tour in the United States and Canada. In the winter and spring of 1836-37 Cobden traveled in Spain, Turkey, and Egypt. On his return he entered into Manchester municipal politics, being one of those who secured the incorporation of that city in 1838. Popular education was a subject of great interest to him, and he discussed it in many public speeches. In 1837 he was a candidate for Parliament at Stockport, but was defeated.

The history of Cobden's connection with the anti-Corn Law agitation began in October, 1838, when an anti-Corn Law association was founded in Manchester. (See CORN LAWS.) Cobden was one of its earliest members and soon became its guiding spirit. He converted the Manchester Chamber of Commerce to his views and made it a powerful instrument of agitation. Anti-Corn Law associations were founded in many towns of the north, and in London, in March, 1839, the delegates of the various associations united to form the Anti-Corn Law League (q.v.), of which Cobden and six others constituted the council. From the first he was the soul of the movement, and to the people at large he seemed to be the embodiment of the cause. With magnificent talents for organization, with an unequalled gift for popular oratory, and above all, with his kindling enthusiasm and tremendous capacity for work, he was what would be called in modern parlance campaign manager, press bureau, and stump speaker all in one. The history of the anti-Corn Law agitation belongs properly elsewhere, but Cobden's activity is so identified with the work of the League that the two can hardly be separated. Wonderful instances are quoted of the sudden conversion of hostile audiences in country and town, as they listened to Cobden's simple, sincere, and irrefutable arguments; and his success in his 'campaign of education' was all the more rapid in that his teachings confined themselves to driving home the elemental truth that food is a desirable thing for people who starve. In 1841 he entered Parliament from Stockport. His reception in the House was not friendly; but his evident sincerity and his straightforward, unanswerable arguments always gained him a hearing. At the beginning of the session, Mr. Charles Villier's annual motion to consider the repeal of the Corn Laws was rejected by a vote of 393 to 90, yet within five years after he had entered Parliament, Cobden had converted Sir Robert Peel and his party to free trade. In 1843 considerable odium was heaped upon his name as the result of an attack on the Government, which Peel unjustly took to be an exhortation to personal violence against himself. Cobden, however, was undaunted, and continued to plead, in Parliament and out, against the "system of legislative murder" which "starved people to death." On March 13, 1845, he delivered an especially powerful speech in the House, at the end of which Peel is said to have muttered, "Those may answer him who can, I cannot do it." The famine in Ireland came to the aid of the Anti-Corn Law League. On December 5, 1845, the Prime Minister pronounced for the total repeal of the Corn Laws and in 1846 the battle had been won. Speaking in

Parliament in that year, Peel declared that to Cobden was due the honor for the great reform which had just been enacted. That the intense earnestness which animated Cobden throughout the struggle was something more than enthusiasm for a principle in economics is shown in the following words of John Bright, his life-long friend and supporter, spoken at the unveiling of Cobden's monument at Bradford in 1877. It was in September, 1841, and Bright was mourning over the dead body of his young wife when Cobden came to him saying: "There are thousands of houses in England at this moment where wives, mothers, and children are dying of hunger. Now, when the first paroxysm of your grief has passed, I would advise you to come with me, and we will never rest until the Corn Law is repealed." The struggle and the triumph are thus described by Mr. Bright: "We were joined, not by scores, but by hundreds, and afterwards by thousands, and afterwards by countless multitudes; and afterwards, famine itself, against which we had warred, joined in. A great minister was converted, and minorities became majorities, and finally the barrier was entirely thrown down, and since then, though there has been suffering, and much suffering, in many homes in England, no wife, and no mother, and no little child has been starved to death as a result of famine made by law."

During the agitation for the repeal of the Corn Laws, Cobden had neglected his own affairs entirely, and at the end he was a poor man. A popular subscription of more than £75,000 was made up for him and he went abroad for rest. His nature, however, was opposed to rest, and during his long travels in France, Spain, Italy, Germany, and Russia, he did not cease to advocate in public speeches and interviews with sovereigns and statesmen the great principles of free trade, peace, and non-intervention. During his absence he was elected to Parliament from the West Riding of Yorkshire (1847), and on his return to England he allied himself with numerous peace societies and subsequently attended a number of international peace congresses in Paris, Frankfurt, and London. In 1849 he moved in Parliament that action be taken toward the establishment of international arbitration, and in 1851 he proposed a general reduction of armaments. He was active in combating the periodic outbursts of anti-Gallic and anti-Russian fever such as that which spread over the country in 1853, and lost thereby that immense popularity which he had acquired in the struggle against the Corn Laws. He bitterly assailed Palmerston's policy of active intervention in European affairs, and with John Bright opposed the war against Russia in 1854, for which he was virulently assailed by the unanimous voice of a war-mad nation. Far from considering the preservation of Turkey as desirable, Cobden maintained that the downfall of the Ottoman Empire in Europe would redound to the welfare of the Christian peoples of the Balkans and to the cause of civilization. In 1857, as the result of an attack by Cobden on the Chinese policy of the Cabinet, the Palmerston Ministry was outvoted and forced to appeal to the country. Cobden stood for Huddersfield, but his unpopularity on account of his attitude toward the war recently ended was still great and he was defeated. In 1859 he came to the United States,

this being his second visit after a lapse of twenty-four years. On his return the post of President of the Board of Trade was offered him by Palmerston, with a place in the Cabinet. Against the urgent advice of his friends, Cobden declined the offer, refusing frankly to take sides with a man from whom he differed *toto caelo* on matters of foreign policy. At the suggestion of M. Chevalier, the eminent champion of free trade, Cobden went to France in 1859 to attempt the negotiation of a commercial treaty between that country and England. He possessed the support of none of the English ministers save Gladstone, but his reputation was such that in his unofficial capacity he succeeded in converting the French Emperor and his ministers to his views. In January, 1860, Cobden was clothed with official authority and in the same month the treaty was concluded. He remained in Paris until November, accomplishing the tremendous labor necessary in the minute adjustment of a new tariff schedule. On returning to England, he declined the offer of a baronetcy and resumed his activity in Parliament. With John Bright he earnestly supported the cause of the North in the Civil War, and in Parliament severely criticised the course of the Government in permitting the equipment of Confederate cruisers for the purpose of preying on American commerce. His last speech in Parliament was delivered in July, 1864. He contracted serious bronchial trouble as the result of exposure in traveling on a public mission to London, and died there July 2, 1865. His death was acknowledged as a national loss by men of such widely differing opinions as Palmerston, Disraeli, and John Bright, and was received with sorrow in France and other countries of the Continent.

Cobden's *Speeches on Questions of Public Policy* were published by his friends John Bright and Thorold Rogers in 1870. The best biography is that by John Morley, *Richard Cobden's Life* (London, 1881). Consult also Garnier, *Richard Cobden, les liqueurs et la ligue* (Paris, 1846); Bastiat, *Cobden, et la ligue ou l'agitation pour la liberté du commerce* (Paris, 1848).

COBDEN CLUB. An association of leading free-traders instituted in London in 1866, in honor of Richard Cobden (q.v.), with the object of diffusing in all parts of the world those principles with which his name is connected. For this purpose it has published tracts, pamphlets, and books, for free circulation, especially in Great Britain, the United States, and the British colonies.

COBEGO, kô-bâ'gô, or **KAGUAN**, kâ'gwân. The native name of a singular group of East Indian flying insectivores, constituting the family Galeopithecidae and genus Galeopithecus, having one species (*Galeopithecus volitans*) and perhaps another. They are known in the Malayan region as cobegos, colugos, kaguans, kubongs, etc., and in many books as flying lemurs, this aberrant and puzzling group having at first been considered lemuroids. They are slender, long-limbed, large-clawed, long-tailed, fox-headed animals, about 18 inches in length, clothed in exquisitely soft, short and protectively mottled fur, and provided with a folded extension of the skin which extends from the neck nearly to the tip of the tail and includes the feet, which are fully webbed. This parachute thus equals that of the best furnished bats in ex-

tent, but it is furry both above and below. The dentition, the pectoral position of the teats, to which the single young one (born so incomplete as to suggest marsupial affinities) is attached, and the habit of clinging to a support head downward, are other resemblances to the bats; in flight the cobego does not equal them, but it can sail longer distances, and come nearer to guiding its course, than do any other 'flying' mammals. It is wholly arboreal in its life, and active mainly in the evening and early morning, disliking the glare of day, and impeded by the darkness of midnight. It spends most of its time scrambling about the branches and seems to feed upon anything that comes in its way, but mostly upon leaves and fruit. In sleep it hangs head downward, clinging with its hind feet, and by means of the prehensile free tips of its tail, when it is nearly invisible among the flickering lights of the leaves. Consult: Wallace, *Malay Archipelago* (London, 1869); Moseley, *Notes by a Naturalist on the 'Challenger'* (London, 1879).

COBET, kô-bêt', CAREL GABRIEL (1813-89). A brilliant Dutch classical scholar. He was born in Paris and studied from 1831 to 1836 in Leyden, where, after a scientific journey to Italy at Government cost in 1840-45, he became a professor in 1847. Cobet was one of the most sagacious and acute of modern critics in the department of Greek philology. He published, besides other works of high merit: *Oratio de Arte Interpretandi* (his inaugural address) (1847); *Variae Lectiones* (1854); *Novæ Lectiones* (1858); *Miscellanæ Criticæ* (1876); *Collectanæ Criticæ* (1878); works on Dionysius of Halicarnassus, and Xenophon; and editions of Diogenes Laërtius, Xenophon's *Anabasis* and *Hellenicæ*, Lysias, and Cornelius Nepos. See TEXTUAL CRITICISM.

COB'HAM, LORD. See OLDCASTLE, SIR JOHN.

CO'BIA, or CRAB-EATER. See SERGEANT-FISH.

COBIJA, kô-bê'já. A seaport in the Province of Antofagasta, Chile, about 70 miles north of Antofagasta (Map: Chile, D 8). It was formerly a considerable town, but has lost its commerce and now contains a population of but 500. Cobija, once known as Puerto la Mar, was part of Bolivia and its only seaport until ceded to Chile in 1883. It suffered from an earthquake and tidal wave in 1877.

COBLENZ, or **KOBLENZ**, kô'blénts (corrupted from the Latin name *Confluentia*, or *Confluentes*, from *confluere*, to flow together, from *con-*, together + *fluere*, to flow). The capital of the Prussian Rhine Province, about 57 miles southeast of Cologne, beautifully situated at the junction of the Rhine and the Moselle, both of which are crossed here by bridges (Map: Prussia, B 3). It consists of the old town, along the Moselle, and the new town, farther up the Rhine. In the old town many of the streets are irregular, narrow, and dirty; but in the new, they are generally well built, moderately wide, and clean. Among the principal buildings are the Church of Saint Castor, founded early in the ninth century, containing the tomb of Archbishop Kuno of Falkenstein; the so-called Kaufhaus, built in 1477 as a town-hall; the ancient Burg, erected by the Archbishop of Treves in 1276, recently restored by the town; and the large Electoral Palace, now a royal palace, completed in 1786. On the extreme point of the city, at the junction

of the rivers, stands the splendid equestrian statue of Emperor William I. erected by the province. Coblenz has numerous and excellent educational institutions, including a royal gymnasium, a teachers' seminary, and a conservatory of music. Its chief industry is the production of the sparkling Moselle wine. There are also manufactures of machinery, pianos, and lacquered wares. Coblenz, with its system of forts, including Ehrenbreitstein on the opposite bank of the Rhine, constitutes a strong fortress. Population, in 1890, 32,664; in 1900, 45,146. Coblenz was known to the Romans as *Confluentes*. In 1018 it was conferred by Henry II, upon the archbishops of Treves. After 1789 it was the headquarters of the French Emigrés, and in 1794 it passed to France. In 1815 it was ceded to Prussia.

COBOURG, kō'börg. The capital of Northumberland County, Ontario, Canada, on Lake Ontario and the Grand Trunk Railroad; 69 miles northeast of Toronto (Map: Toronto, E 4). It is a port of entry, with a commodious harbor and regular steam communication with United States and Canadian lake ports, and has woolen mills, car-factory, and breweries. The town is well built and contains a college, and owns a public hall and municipal gas, electric lighting, and water works. Population, in 1891, 4289; in 1901, 4239.

CO'BRA, or **COBRA DE CAPELLO**, kō'brā dā kā-pēl'ō (Port., hooded snake). One of a group of Oriental venomous snakes constituting the proteroglyphic genus *Naja*. There are six or seven species, dwelling in Asia and Africa. Of the African species the best known is the asp (*Naja haic*); see ASP. The Asiatic cobras are not large, except the 'giant' cobra (*Naja bungarus*), which is sometimes 13 feet long. (See HAMADRYAD.) Several species belong mainly to the Malayan region and are comparatively small and harmless. None is American, the 'cobras' of Brazil being something else, usually harmless.

The cobra de capello (*Naja tripudians*) is the most interesting one, as it is exceedingly numerous throughout India and Ceylon, thence westward to the Caspian, and eastward throughout the Malay Peninsula and into southern China; and is justly regarded as the most deadly of venomous serpents—certainly the most harmful considered in the aggregate, the annual mortality from its bite in India alone exceeding 5000 human beings, besides a great quantity of live stock. Little can be done to prevent this, because of the religious veneration with which the 'blacksnake' (the native name) is regarded by the larger part of the population. This species rarely exceeds six feet in length and is a rather slender, brownish snake (bluish beneath) with lighter cross-bars; but the markings are variable. The head is small, without the triangular and separated appearance of the vipers; but when the snake is angry or excited and about to strike, it lifts from the ground a third of its length, and spreads the nuchal ribs until the neck expands into a broad, shell-like hood of terrifying appearance; and the back of this hood displays a yellow mark, more or less of the shape of a pair of spectacles.

These cobras wander even up to elevations of 8000 feet in the Himalayas, but are most common in the lowland jungles, where they are able to climb trees, although seldom doing so; and as they can swim well they often enter the water after frogs, fish, etc. They are attracted to vil-

lages, enter gardens and houses in search of mice and other small mammals, or of eggs and young poultry, and are likely, especially during the rainy season, to take up their residence in old houses, broken walls, fodder-stacks and rubbish-heaps, and remain there. It is about such places, especially at night, that they are most often trodden upon, and fatal bites are received. They are sluggish and strike rarely except when provoked or endangered; and they may be killed by a slight blow. Their bite, when well delivered by a vigorous snake, is almost surely fatal; men have been known to perish within half an hour, and in such cases all so-called remedies are useless. The immunity this snake receives among the Hindus is due to a belief that it once spread its hood as a shade over Buddha while he slept, and was blessed by the saint, who placed the spectacle-mark upon its back as a warning to the kite not to molest it. Little headway can be made against this superstition in efforts toward extermination of this deadly reptile, which occasionally penetrates even the gardens and parks of large towns. Its natural enemies are few, chiefly the kite, the mungoos (q.v.), and cattle (by tramping).

BIBLIOGRAPHY. For these and other poisonous snakes of the Old World, consult authorities referred to under SNAKE; also Favre, *Thanatophidia of India* (London, 1874); Ewart, *Poisonous Snakes of India* (London, 1878). See PROTEROGLYPHA; and Colored Plate of FOREIGN VENOMOUS SERPENTS.

COBRE, kō'brā. A small town in the Province of Santiago, Cuba, about 9 miles from Santiago de Cuba. It is the centre of a copper-mining district, and derives its name from that metal. Cobre dates from the sixteenth century, the mines having been exploited first in 1558. Population, 1899, 1028.

COBURG, kō'boorik (Lat. *Melocobus*). The capital of the Duchy of Coburg, and, alternately with Gotha, the residence of the Duke of Saxe-Coburg-Gotha, picturesquely situated on the left bank of the Itz, a tributary of the Main, about 26 miles north-northeast of Bamberg (Map: Germany, D 3). Its principal public buildings are chiefly found on the Marktplatz and Schlossplatz. The former, adorned with a statue of Prince Albert, contains the old Rathaus, the handsome Government buildings, and the arsenal, with the Ducal Library of 60,000 volumes. The Schlossplatz contains the large palace erected in 1549 and restored in 1693, two smaller ducal palaces, and the theatre. The Church of Saint Moritz, a handsome late Gothic structure, dating from the fifteenth century, contains some fine monuments and brasses. On a hill about 500 feet above the town stands the ancient castle of the Dukes of Coburg, dating from the eleventh century. It has recently been restored and fitted up as a museum. The rooms which Luther occupied, when in concealment here in 1530, are still exhibited to the visitor, as well as the pulpit from which he preached in the chapel of the castle. There are flourishing industries of beer-brewing, the weaving of woolen and linen fabrics, and the manufacture of porcelain and basket ware. Population, in 1890, 17,106; in 1900, 20,459. The town of Coburg grew up around the castle, and is mentioned for the first time in 1207. In 1485 it passed to the Ernestine line of Saxon Dukes, and became in 1735 the capital of Saxe-Coburg.

COBURG FAMILY. An old German ducal family, dating from the fifteenth century, which has contracted various alliances with the English and Continental royal houses. Queen Victoria's mother was a sister of Duke Ernest I. of Coburg. The first wife of Ernest's brother, Leopold I., King of Belgium, was a daughter of George IV., of England, and his second wife was a daughter of Louis Philippe. Albert (q.v.), the son of Ernest I., was the husband of Victoria.

COBURG PENINSULA. A peninsula on the north coast of Australia, lying west of the Gulf of Carpentaria. It extends in a northwesterly direction toward Melville Island, from which it is divided by Dundas Strait (Map: North Australia, E 1). On its northeast side is the bay known as Port Essington, at the head of which, about latitude $11^{\circ} 22'$ S., longitude $132^{\circ} 10'$ E., was established, in 1839, the settlement of Victoria—abandoned, on account of its insalubrity, six years later. The district abounds with swamp buffaloes which were originally imported from Java.

COBWEB. The web woven by spiders, principally by small, slim spiders of the family Theridiidæ. See SPIDER.

COBWEB. One of the four fairies that appear in Act iii., Scene 1. and Act iv., Scene 1, of Shakespeare's *Midsummer Night's Dream*; a dainty creation who speaks just three words during the entire play.

CO'CA (So. Amer. name), *Erythroxylon coca*. A shrub of the natural order Erythroxylaceæ, of which the leaves are much used by the inhabitants of Peru and Bolivia as a narcotic and stimulant. (For illustration, see Plate of CORNFLOWER.) The dried leaves are chewed with a little finely powdered unslaked lime or with the alkaline ashes of the quinoa (q.v.), or certain other plants. The principal constituents of coca are cocaine, and several derivatives, hygrine, cocatannic acid, etc. As a local anæsthetic the alkaloid cocaine is unexcelled. The common forms of administering are in the wine of coca, a fluid extract, and the alkaloid cocaine. The properties and effects of coca resemble those of opium, although it is less narcotic, while it possesses the property of dilating the pupil of the eye, which opium does not possess. It also lessens the desire for ordinary food, and for some time, at least, enables the person who uses it to endure greater and more protracted exertion than he otherwise could, and with less food. The leaves are sometimes mixed with forage for mules, when especially long trips are taken. It is especially remarkable for its property of preventing the difficulty of respiration, so common in the ascent of long and steep slopes at great elevations. But when used habitually and in excess, it weakens the digestion, produces biliary and other disorders, and finally induces a miserable ruin both of body and mind. It has been in use from a very remote period among the Indians of South America, and was extensively cultivated before the Spanish conquest. Many of the Indians of the Peruvian Andes are to this day excessively addicted to it, and its use prevails also to a considerable extent among the other inhabitants of the same regions. Its culture and use have extended into Brazil. (See COCAINE.) The shrub is extensively cultivated in various parts of South America and in Ceylon,

India, and Java. It could probably be grown in parts of Florida and California. The shrub is 3-6 feet high, with rusty branches and leaves somewhat like tea-leaves, which are borne on the ends of the branches, the small yellow flowers some distance below. The annual production of leaves in South American trade is estimated at 30 to 50 million pounds. There are many other species of *Erythroxylon* in addition to *Erythroxylon coca*. The name is from the red wood of some species.

COCADRILLE, kô'kâ-dril. A monster described by Sir John Mandeville as living on the island of Silha, and corresponding to the crocodile, of which the word is an early form.

COCAINE, kô'kâ-in, $C_{17}H_{21}NO_4$. An alkaloid derived from coca-leaves. The hydrochlorate, $C_{17}H_{21}NO_4HCl$, produces temporary insensibility when applied to the conjunctiva, mucous membranes, or denuded surfaces, or when injected beneath the skin. It is not absorbed by the unbroken skin, however. It also causes a temporary contraction of the blood-vessels of the region anæsthetized, but this is followed by congestion. Applied to the conjunctiva, it causes anæsthesia, dilatation of the pupil, diminution of intraocular tension, and some interference with accommodation. For dilating the pupil it is sometimes employed in combination with homatropine (q.v.). As a local anæsthetic for regions covered by skin it is injected in solution, by a hypodermic needle, into the tissue which is to be anæsthetized. The toxic dose varies greatly, some persons being unfavorably affected by a small amount. The only result may be restlessness and excitement, or there may be headache, rapid respiration, delirium, coma, or convulsions, with wide dilatation of the pupils. Persons addicted to the cocaine habit use the drug internally or by hypodermic injection. Its prolonged use causes digestive disturbance, general weakness of mind and body, muscular twitching, and insomnia.

Within recent years cocaine has been successfully employed as an anæsthetic in major surgical operations; if injected into the spinal column, cocaine has the remarkable effect of producing complete insensibility to pain in the entire part of the body below the point where it is injected, but no effect at all above that point. The advantage of not causing anæsthesia where it is unnecessary is obvious; nor does cocaine, in the hands of an expert surgeon, produce any disagreeable after-effects. See ALKALOIDS.

COCANADA, kô'kâ-nâ'dâ (corrupted from Telugu *kakinadi*). The capital of the Godavari District, Madras, India, 315 miles north-northeast of Madras, and after that city, the principal port on the Coromandel coast (Map: India, D 5). Navigable canals connect it with the Godavari River at Dowlaishwaram. The commercial establishments and docks of the town are on the banks of one of these canals which leads to the protected roadstead in Coringa Bay. It has a lighthouse visible fourteen miles. Large quantities of cotton are exported, and there are exports also of rice, sugar, oil-seeds, and cigars. Population, 41,000.

COCCAJO, MERLINO. See MERLINO COCCAJO.

COCCEIANS, kôk-sé'yanz. The name given to the adherents of Johannes Coccejus, the seventeenth-century theologian (q.v.), who held

that the future history of Christianity was to be found foreshadowed in the Old Testament.

COCCEIUS, NERVA, or NERVA MARCUS (2-33). The grandfather of the Emperor Nerva—elected consul A.D. 22. His legal learning is extolled by Tacitus and he is frequently mentioned in the *Digest*. He was the originator of the tunnel (Grotta di Posillipo) on the road leading from Naples to Baiae, and had charge of public works under Tiberius, to whom he was a constant companion. Notwithstanding the Emperor's entreaties, he starved himself to death in the year A.D. 33, because of continual ill health.

COCCEJI, kók-tsā'yé, HEINRICH VON, Baron (1644-1719). A German jurist. He was born at Bremen, and studied jurisprudence and philosophy in Leyden and afterwards in Paris and Oxford. He was made professor in Heidelberg in 1672 and in Utrecht in 1688, and two years later was appointed to a similar office in Frankfort-on-the-Oder. In 1712 he was created a baron of the realm. As an erudite jurist, Cocceji was the oracle of many courts, and his work on German civil law, *Juris Publici Prudentia* (1695), was almost universally used as a textbook for this branch of jurisprudence.

COCCEJI, SAMUEL VON, Baron (1679-1755). A German jurist, born in Heidelberg, son of the preceding. He became Prussian Minister of State and of War (1727), director of ecclesiastical affairs and curator-general of the universities of the kingdom (1730), president of the High Court of Appeals (1731), chief of the Prussian judiciary (1738), and Chancellor (1747). He exerted the greatest influence upon the development of Prussian law. The legal codes prepared by him, and respectively entitled *Projekt des Codicis Fridericiani Pomernieci* (1747), and *Projekt des Codicis Fridericiani Marchici* (1748), remained in operation until 1780.

COCCEJUS, kók-tsā'yōōs, or KOCH, JOHANNES (1603-69). A German Protestant theologian. He was born in Bremen, and made his first studies there. In 1625 he went to Hamburg, and acquired a thorough knowledge of Oriental languages under the guidance of a learned Jew. Returning to Bremen in 1630, he taught Hebrew there, and was appointed professor of theology in Franeker in 1643, and in Leyden in 1650. Coccejus's chief work is the *Lexicon et Commentarius Sermonis Hebraici et Chaldaici Veteris Testamenti* (Leyden 1669), the first tolerably complete dictionary of the Hebrew language. In spite of his great learning, Coccejus held very peculiar hermeneutical principles, which enabled him to discover the whole New Testament in the Old. The representation abundantly employed in the latter of a covenant between God and man, he carried out in his interpretation of the New Testament, and made it the centre of his theology. This idea of there being two covenants—one of grace, that after it—was first broached by William Ames (died 1633); but Coccejus elaborated it, and so became the virtual founder of the federal theology (q.v.). the theology of the Westminster standards, and long accepted by all the Reformed. The most complete exposition of his views is in his *Summa Doctrinae de Federe et Testamento Dei* (1648). His collected works

were issued in Amsterdam (1675), with a life by his son.

COC'CIDÆ (Neo-Lat. nom. pl., from Lat. *coccum*, Gk. κόκκος, *kokkos*, berry). A family of bugs, including the scale-bugs or bark-lice, the mealy bugs, and others without popular names. This family not only departs the most widely from the Hemiptera, but in it the most anomalous forms among insects are found; and the most extraordinary diversities occur, even in the two sexes of the same species. The habit of secreting a shell or covering of some sort is common to all the Coccidæ, most frequently in the form of a scale made up of cast skins and excreted matter. Sometimes, as in the case of the mealy bugs, the covering is white and powdery; and in the 'ground-pearls' it is glassy or shell-like, and may entirely encase the insect. A few gall-forming species occur in Australia. The young mite-like females at first have the power of locomotion. The perfect male has only one pair of wings, like flies. Sexual reproduction is the normal method, while parthenogenesis and viviparous reproduction, so common in the aphids, is a rare method among the Coccidæ. Almost complete histolysis may occur in the female, lasting for several years. The young of both sexes sink the rostrum into plants, suck the sap, and secrete a waxy coating or shield of some sort, under which they undergo subsequent development. Coccidæ occur on bark, leaves, and fruits of various trees, and as they are sap-suckers they may greatly impoverish or kill the plant. The black or brown scale-like spots on oranges and lemons are really scale-insects, and by such transportation they gain world-wide distribution. Honey-dew is secreted by the Coccidæ, but usually not so plentifully as by the Aphidæ, yet Réaumur records a case where it dripped to the ground and tasted sweet. The 'man' still used by the Arabs for food is probably the manna of Exodus, and is secreted by a coccus. White wax is secreted by a species in India, and another produces in China the wax commercially known as China wax. The shelly resinous scale produced by another form is the lac or shellac of commerce, while the body of the lac-producing insect affords the red dye known as lake. Other Asiatic and European species furnish dyes. The tropical American *Coccus cacti*, however, yields the most famous of the insect dyes, known as cochineal (q.v.). Axin and axinic acid are produced by another Mexican coccus. For the latest information concerning the family, consult: Green, *Coccida of Ceylon* (London, 1896-99); Newstead, *Monograph of the Coccida of the British Isles* (Ray Society, London, 1900); also publications of the United States Department of Agriculture, and articles by Cockerell in the *Canadian Entomologist*. See LAC-INSECT; SCALE-INSECT.

COCCIUS, kók'tsé-ōōs, ERNST ADOLF (1825-90). A German oculist, born near Leipzig. He studied medicine at the universities of Leipzig and Prague, and practiced several years in Leipzig, where he became connected with the university in 1851. He was made full professor of medicine there in 1867. Coccius made contributions of great value to the diagnosis of the diseases of the eye. His published works include: *Ueber die Anwendung des Augenspiegels nebst Angabe eines neuen Instruments* (Leipzig, 1853);

Ueber die Neubildung von Glashäuten im Auge (1857); *Der Mechanismus der Akkomodation des menschlichen Auges nach Beobachtungen im Leben* (1867); *Ueber Augenverletzungen und ihre Behandlung* (1871); *Ophthalmometrie und Spannungs-messung am kranken Auge* (1872); *Ueber die Diagnose des Schpurgurs im Leben* (1877).

COC'CO (West Indian name), COCOA-ROOT, TARO, or EDOOES. Plants of the genus *Colocasia*, and of the nearly allied genus *Caladium*, of the natural order Araceae, very generally cultivated in tropical and sub-tropical countries for their roots, or flat underground corms, which abound in starch, and are used as articles of food, being deprived by roasting or boiling of the characteristic acidity of the order—which, indeed, some of them possess in a comparatively small degree. They are totally different from the true yams. The names coco, cocoa-root, and eddoes, perhaps more strictly belong to *Colocasia antiquorum*, a stemless plant with ovate leaves, and flowers inclosed in a cylindrical erect spathe. The taste of its roots is like that of potatoes, and the plants are much cultivated. *Colocasia macrorrhiza* is a closely related species of the South Sea Islands. In the Himalaya these plants form the principal food of many of the inhabitants. The root in its fresh state is stimulant, diaphoretic, and expectorant. In Hawaii, and the South Sea Islands generally, taro is one of the staple sources of food for the natives. The rootstock is roasted, after which it is pounded in wooden trays with water into a thick dough. This is allowed to ferment, and may be eaten in that state or prepared in a number of ways. Its native name in Hawaii is poi. In Japan, Porto Rico, etc., the rootstocks are utilized as we use potatoes.

COCCOSTEUS, kōk-kōs'tā-ūs (Neo-Lat., from Gk. κόκκος, *kōkkos*, berry + ὀστρα, *ostron*, bone). A genus of heavily armored fishes, of the order Arthrodira, fossil remains of which are found in the Devonian rocks of Europe and North America. The head and the forward part of the trunk were covered with strong, bony plates, and the plates of these two regions articulated by a hinge-joint that admitted of free movement of the head upon the trunk. The skull had large orbits, placed well forward, and in the middle of the frontal surface was a pit that indicated the position of the pineal body. The jaws were strong, and the mandibles or lower jaws were furnished with conical teeth. The trunk of *Coccosteus* was shark-like in form, and was provided with a single dorsal fin, an anal fin, and a pair of rudimentary pelvic fins. It was probably covered by a soft skin that readily decomposed after the death of the animal, and that hence escaped fossilization. The vertebral column shows an interesting progressive stage in the evolution from the cartilaginous backbone of the earlier fish to the completely calcified skeleton of the later genera. The neural arches and the spiny processes of the vertebrae have alone become calcified, so that in well-preserved specimens they appear as two rows of bony processes, with an intervening empty canal that represents the cartilaginous centra or 'bodies' of the vertebral elements. All the species of the *Coccosteus* are small, none of them having been found with a length greater than 20 inches. The best-known species and the type of the genus is *Coccosteus*

decipiens, which is common in the Old Red Sandstone of the Scottish Devonian. A few specimens, though none so perfect as the Scottish, have been found in the North American Devonian. See FISH; DIPNOI; LUNG-FISH.

COC'ULUS IN'DICUS (Neo-Lat. *cocculus*, dim. of Lat. *cocum*, berry, and Lat. *indicus*, Indian). The name given to a very poisonous seed brought from the East Indies, which is used for various medicinal purposes, and illegally, it is said, for imparting a bitter flavor to malt liquors. It possesses acrid and intoxicating qualities. It is used in India for stupefying fish, that they may be taken by the hand. When the seeds, known as 'fish-berries,' are thrown into a stream, any fish in the neighborhood are quickly stupefied. It contains a most poisonous principle, called 'picrotoxin,' while the pericarp contains another called 'menispermim,' equally poisonous. It is the seed of the *Anamirta paniculata*, a beautiful climbing plant, of the natural order Menispermaceae. The action of picrotoxin, when taken internally in poisonous doses, resembles that of strychnine (see NUX VOMICA); the most noticeable symptoms being uneasiness, restlessness, and tetanic convulsions. The drug is used to destroy lice and the parasite ringworm. It has been employed internally, in small doses, to check the night sweats of phthisis. Poisoning occasionally occurs from drinking the drug, as it is sometimes prepared as a domestic parasiticide—the bottle being filled with equal volumes of the berries and rum, and allowed to stand after shaking. Absorption through broken skin also causes poisoning at times. The genus *Anamirta* is closely allied to the genus *Cocculus* (see CALUMBA), in which it was formerly included. The fruit of several allied species possesses properties analogous to those of the *Anamirta paniculata*.

COC'CYX. See SPINAL COLUMN.

COCHABAMBA, kō'chā-bām'bā (*Cocha*, lake + *bamba*, plain). The capital of the Department of Cochabamba, Bolivia, situated on the Río de la Rocha, in a fertile valley, about 8000 feet above the sea-level (Map: Bolivia, D 7). It is laid out with wide and regular streets, and contains several pretentious structures, notably the theatre, Government building, and the hospitals of Viedma and San Salvador. Cochabamba has a college and secondary schools. The city manufactures cotton and woolen goods, leather, soap, and earthenware, and besides carries on considerable trade, especially in grain. Population, in 1896, 29,530. Cochabamba was founded in 1563, and was called Oropesa. In 1847 it was created an episcopal see.

COCHEM, kō'kēm. The capital of a district in the Rhine Province, Prussia, at the confluence of the Moselle and Ender, 24 miles southwest of Coblenz. It is noted for its picturesque situation, near the entrance to the Emperor William Railway Tunnel, two and two-thirds miles in length, the longest in Germany. Cochem has steamboat and railway stations, interesting mediæval houses, and a beautiful riverside park, in which is a war monument by Schies. The ancient episcopal castle of the archbishops of Trèves, destroyed by the French in 1689 and restored since 1868, crowns a hill to the south of the town. Population, in 1900, 3586.

COCHERY, kôsh'ré', LOUIS ADOLPHE (1819-1900). A French statesman. He was born in Paris, where he practiced law, and occupied the post of Chief of Cabinet in the Ministry of Justice during the Revolution of 1848. He was subsequently editor of the *Avenir National*, and in 1868 established the journal entitled *L'Indépendant de Montargis*. As a member of the Legislative Assembly, he declared against the war with Germany, and after September 4, 1870, acted as General Commissioner of the National Defense in the Department of Loiret. Under Dufaure, he became under-secretary of the finances, and from 1875 to 1884 he was minister of the postal and telegraphic service.

COCHIMI, kô-chê'mé. A tribe, possibly of Yuman stock, formerly occupying the northern and central portions of the peninsula of Lower California, Mexico. According to the account of the Jesuit Baegert, who labored among them for some years in the middle of the eighteenth century, they, like the Guaicuru and Perien, who occupied the southern part of the peninsula, were in the lowest grade of culture, naked, without agriculture of any kind, and with no permanent shelters, depending entirely upon fishing, hunting, and wild fruits for subsistence. The dead were first buried, and after a certain time the remains were dug up, the bones cleaned and painted red, and preserved in ossuaries.

COCHIN, kô-chên' or kô'ehin (Tamil *kœi*, Telugu *kœi*, harbor). Once the capital of the principality of the same name, but now a seaport of the District of Malabar, Madras, British India (Map: India, C 7). It stands on the south side of the principal channel between the open ocean and a lagoon known as the 'Back-water.' This lagoon, 120 miles long, is, even in its lowest state, always navigable for canoes, and forms a valuable means of communication with the interior. Cochin is one of the chief cities on this coast for ship-building and maritime commerce. Here the Portuguese erected their first fort in India, in 1503. They were supplemented by the Dutch in 1662. Under the Dutch Cochin was a great emporium of trade. In 1796 the town was captured by the British, and again in 1806, when its fortifications and public buildings were destroyed and its private dwellings very much damaged. Notwithstanding this check, the place continued to flourish. It has a safe harbor, citadel, and arsenal. It is the see of a Roman Catholic bishop and of two Syrian bishops. Among the buildings is a church erected by the Portuguese in the early part of the sixteenth century. The population, numbering about 17,600, is very heterogeneous, including Hindus, descendants of the Portuguese and Dutch, Armenians, Arabs, Jews, and Persians. The Black Jews of Cochin occupy a separate suburb. The trade consists chiefly in the export of cocoa oil, cocoa-fibre, teak-wood, cardamoms, etc. Water is brought from a distance of 18 miles. The average temperature is 78° F. Adjoining Cochin is a native town of the same name, nearly as populous, in the State of Cochin.

COCHIN, kô-chên'. A native State, tributary to Madras, India (q.v.), bounded northwest, north, and northeast by Malabar and Coimbatour; east and south by Travancore, and west by the Indian Ocean (Map: India, C 6). It has an area of 1362 square miles, consisting chiefly of low-

land, lying between a narrow stretch of raised coast-line and the Western Ghâts (q.v.), part of which are included in the State and separate it from inner India. Behind the coast-line lies the shallow backwater, 120 miles long, and varying in breadth from a few hundred yards to ten miles; it has three connections with the ocean, and is fed by the variable mountain torrents of the Ghâts. During the wet season the backwater forms a navigable channel. The region is one of the most humid in the world, especially during the southwest monsoon of June, July, August, and September; even during the remainder of the year dry weather is comparatively unknown. The cocoanut is the most valuable product of the country; the forests also produce red cedar, teak, and other hard woods, but these are becoming scarce. Rice, pepper, cardamoms, ginger, betel-nut, yams, arrowroot, sweet potatoes, and coffee are cultivated in the low country. There are manufactures of salt on the coast. The capital is Ernakolam, although the ruler's palace is situated at Tripunthora; the chief seaport, besides the British town of Cochin (q.v.), is Malipuram. Population, in 1891, 723,000; in 1900, 815,200, consisting chiefly of Hindus; there are a few Mohammedans and a large number of Christians and Jews. The Jews are classified into white and black; and the Christians, estimated at one-fifth of the population, are divided between the Syrian and Romish churches; they trace their origin partly to the Portuguese conquest and partly to the missionary labors of Saint Thomas, the Apostle. Consult: Day, *Land of the Pearls: or, Cochin, its Past and Present* (Madras, 1863).

COCHIN (from *Cochin-China*). A breed of large domestic fowls, highly esteemed as producers of flesh and large eggs. They are known in black, buff, partridge (variegated), and white varieties, have yellow-feathered legs (except in the black variety), and single erect combs. See FOWLS, and Colored Plate of FOWLS.

COCHIN, kô'shân'. CHARLES NICOLAS (1715-50). A French engraver and art critic, born in Paris. He was the most celebrated of a prominent family of engravers and painters, and was the son of Charles Nicolas Cochin (1688-1754) and Louise Madeleine Hortemels, who was an etcher of note. He became engraver to the King in 1739, and in this capacity executed a series of Court subjects, such as "The Marriage of the Dauphin" (1755). His designs include vignettes, frontispieces, ornamental letters, and a number of portraits. His works were catalogued by Jombert in 1770. Among them are etchings for Joseph Vernet's *Ports de France* (1760-67), and designs for the *Orlando Furioso* (1775-83) and the *Jerusalem Liberata* (1783-86). He was made perpetual secretary to the Académie des Beaux-Arts in 1755. His criticisms on art have been printed under the title *Œuvres diverses* (1871); and he also wrote *Voyage d'Italie* (1758), and some *Mémoires secrets* (1881).

COCHIN-CHI'NA, kô'ehin-chi'ná. A possession of France, in the extreme south of the peninsula of Indo-China, lying between Cambodia and Annam on the north and the China Sea (Map: Asia, K 7). Its area is estimated at 23,160 square miles. It is traversed by the Mekong, which forms an extensive delta. The country is mainly a low plain, of alluvial origin.

There is a region of granitic highlands in the northeast, representing the last spurs of the Anam chain, and reaching a height of 2300 feet. The Mekong separates into three arms in Cochinchina, and together with many smaller rivers forms a network of waterways. The Province of Saigon is watered by the rivers Saigon, Donnai, and the two Vaicos. The delta-land, almost wholly covered with rice-fields and gardens, is frequently inundated, and the peninsula of Camau is like a great deserted swamp.

Cochin-China lies in the region of the monsoons. Typhoons frequently work great destruction. The healthfulness of the climate varies inversely with the frequency of the rains. The severest heat is in the spring of the year. Places near the seacoast are most favorable to Europeans. The flora is like that of Indo-China in general. The gamboge-tree abounds, but palms are few. The vast forests are rich in the finest kinds of timber. There is game of every sort, from the elephant, rhinoceros, tiger, deer, and wild boar, to the smallest rodents. Among the birds are the peacock, partridge, snipe, woodcock, and pheasant. The rivers contain fish of many species; alligators are numerous. There is little mineral wealth, except phosphate of lime and salt. Most of the inhabitants are agriculturists and fishermen. About one-fifth of the area is cultivated, and the chief product is rice, which amounted in 1900 to 607,800 tons. The coffee-culture is rapidly growing. There were 429,228 coffee-plants in 1899, mostly belonging to Europeans. Sugar-cane, mulberry-leaves, pepper, betelnuts, cotton, tobacco, maize, and various valuable grasses, seeds, gums, and drugs are also produced. There are 200,000 water-buffaloes and 150,000 zebus employed in labor. There are no native industries worthy of mention, except the manufacture of salt and of coarse silk stuffs.

There are few good roads; but the innumerable little streams give easy access to all parts of the country, and new canals have been excavated by the French to facilitate commerce. There are 51 miles of railway. Concessions have been granted to build a line from Saigon to Tan-linh. In 1896 there were 2276 miles of telegraph. The chief article of commerce is rice. The minor exports consist of fish, cotton, silk, hides, and pepper. The articles imported are textiles, metals and metal implements, and liquors. The imports and exports for 1900 amounted to 121,675,000 francs and 107,350,000 francs respectively. The principal commercial port of the colony is Saigon (q.v.), the capital. In 1900 573 vessels cleared here, with 770,422 tons. Trade is almost entirely in the hands of the Chinese. There are five banks at Saigon. The local annual budget of 1901 balanced at 4,204,244 piastres.

The colony is represented by a Deputy in the French Parliament. It is divided into four large provinces—Saigon, Mitho, Vinh-long, and Bassac—and twenty districts or inspectorates. The municipalities of Saigon and Cholon are officially designated as 'provinces'. The Lieutenant-Governor is assisted by a Privy Council, composed of all the heads of departments as official members and several unofficial members. Under the Executive is a Colonial Council of fifteen members, seven of whom are natives, partly elected by the residents. The smaller councils in the arrondisse-

ments are often composed entirely of natives. Municipal councils, part French and part native, rule in Saigon and Cholon. Every chief town has a citadel and garrison, and the collection of revenue and the suppression of robbery are secured by military posts in the interior. Besides a varying number of French troops, a force of 2405 native soldiers is maintained. The population in 1898 was estimated at 2,323,499, of whom 4451 were Europeans, 2,054,851 Annamites, 183,659 Cambodians, 65,801 Chinese, and 6374 Mois. The Catholic population numbers about 75,000, and the Buddhist 1,700,000. In 1897 there were 376 schools, with 804 teachers and 18,760 pupils. Cochinchina before the second half of the nineteenth century constituted a part of China, Cambodia, and Annam successively. In 1861 the French took Saigon, and by treaty in the following year acquired the provinces of Saigon, Bienhoa, and Mitho. Hostilities continued until 1879. In 1888 the colony became a part of the Governor-Generalship of Indo-China. The name Cochinchina was formerly applied to the whole eastern division of the Indo-Chinese Peninsula, including Tongking, Annam proper, and Lower Cochinchina. Consult: Lemire, *La Cochinchine française* (Paris, 1887); De Lanessan, *L'Indo-chine française* (Paris, 1888); Norman, *Peoples and Politics of the Far East* (London, 1895); Baurac, *La Cochinchine et ses habitants* (Saigon, 1896-99).

COCHINEAL, kōch'ī-nēl (from Sp. *cochinilla*, cochineal, wood-louse, from Lat. *coccineus*, scarlet, from *coccum*, berry, or from Sp. *cochina*, sow; so called either from the color, or, if the second derivation be preferred, from the shape). A scale-insect used as a dyestuff for scarlet and crimson, and in the preparation of carmine and lakes. Cochineal consists of the bodies of the females of a coccid (see COCCIDÆ) called *Coccus cacti*, because it feeds upon plants of the cactus family, particularly on one known in Mexico as the nopal (*Opuntia cochinillifera*), nearly allied to the prickly pear. (See CACTUS.) These insects are minute, 70,000, it is said, being required to weigh a pound in a dried state—when not adulterated by red lead or other heavy dust. The male is of a deep-red color, and has white wings. The female, which is wingless, is deep-brown, covered with a white powder; flat beneath, convex above. Branches of nopal covered with insects are cut off before the rainy season sets in, and carefully sheltered in a covered building. From these supplies the plantations are stocked at the close of the wet season, about the middle of October. When warmed by the sun the females soon begin to lay eggs, each female producing more than 1000 young, which soon spread themselves over the plants. The males are very few—not more than 1 to 100 or 200 females—and are of no value as a dye. The first crop of females is picked off about the middle of December, and until May successive generations are gathered from time to time. The females, full of young, lose about two-thirds of their weight in drying. The process of gathering the insects is extremely tedious, a day's picking amounting only to about two ounces of cochineal. The killing is done in three ways: (1) By placing on a hot iron; (2) by placing in a hot oven; and (3) by dipping in a basket into boiling water, which is considered the best method. When killed and dried, they

may be kept for any length of time without injury. The name 'cochineal' is limited to that species first cultivated in Mexico, but long transplanted successfully to the Canary Islands, Java, and other warm parts of the Old World. Other species were known to the ancient Hebrews and Egyptians, and were largely cultivated on a species of oak. Among the Arabs this insect is known as *kermes*, 'red dye,' and it is largely cultivated in Algeria (*Knowledge*, London, 1991). Cochineal was formerly much used for coloring wool or silk a scarlet or crimson; but, owing to the cost of its production, and to the fact that the colors, although brilliant, are not very enduring, this dye has been greatly replaced by cheaper coal-tar products; and, for this reason, the cochineal industry has been rapidly declining. See CARMINE.

COCHITUATE (cô-chit'û-ât) LAKE. A lake in Middlesex County, Mass., 17 miles west of Boston. It is very narrow and irregular, with a length of about four miles, and has an area of little more than one square mile. From this lake and the connecting ponds, the city of Boston draws its principal supply of water (Map: Massachusetts, E 3).

COCHLEA, kôk'lê-â. See EAR.

COCHLEARIA, kôk'lê-â'rî-â. See SCURVY-GRASS.

COCHRAN, JOHN (1813-98). An American soldier and lawyer. He was born in Palatine, N. Y., graduated at Hamilton College in 1831, served as Surveyor of the Port of New York from 1853 to 1857, and from 1856 to 1862 was a Democratic member of Congress, where he took a prominent part in the debates on land reform, revenue, and other public questions. At the outbreak of the Civil War he became colonel of the First United States Chasseurs, which he commanded in the Peninsular campaign. In June, 1862, he was appointed brigadier-general of volunteers, but resigned his commission in June, 1863, on account of failing health. In 1864 he was nominated for the Vice-Presidency on the ticket with John C. Frémont. As leader of the New York delegation to the Cincinnati Convention in 1872, he was instrumental in securing the nomination of Horace Greeley (q.v.) for the Presidency.

COCHRANE, kôk'ran, THOMAS, tenth Earl of Dundonald (1775-1860). A British admiral, familiarly known as Lord Cochrane. The son of the ninth Earl of Dundonald, he was born at Annsfield, Lanarkshire, December 14, 1775. His father, a scientist, ruined himself by experimental invention, and Thomas received such desultory education as was volunteered by the village minister and schoolmaster. He was destined for the army, but in his seventeenth year joined his uncle's ship, on which he had been enrolled five years previously, and, in consequence of this priority, received rapid promotion. After serving in the Norway fiords and on the North American station, he won recognition in 1801 by a successful series of daring exploits in the Mediterranean, the most brilliant being the capture of a Spanish frigate of 600 tons and 319 men, which had been sent in quest of his small brig of 158 tons and 54 men. Shortly afterwards his vessels were captured by three French line-of-battle ships, after several hours' resistance, but he was himself immediately released on parole. In 1802 he took advantage of the peace to repair his defective early education by a six months' assiduous course at Edinburgh University. He had imprudently offended Lord Saint Vincent by a comparison, and at the renewal of hostilities in 1803 he was maliciously appointed to the stagnant Orkney station to protect non-existent fisheries. But with a change of admiralty in 1804, he received a new ship, and within ten days captured several prizes. By a daring ruse he cleverly evaded a squadron of French battle-ships and sailed his prizes into Plymouth Harbor, three golden candlesticks, each five feet high, decorating his mastheads as specimens of spoil. In 1806, after a rejection, owing to his refusal to bribe the electors, he was returned as member of Parliament for Honiton. The next year he was elected for Westminster, but his indiscriminate exposure of naval abuses led to his being immediately ordered off to the Mediterranean. During four years he added to his reputation by a sequence of minor naval exploits, and in 1809 was selected to burn out the French fleet which Lord Gambier had blockaded in Aix Roads, near Rochefort. He drove almost the whole squadron ashore, and destroyed four ships; but, as he was unsupported by his superior, Gambier, who deliberately ignored his signals, the victory was incomplete. Cochrane received the Knighthood of the Bath, but he emphatically expressed his disgust at the incompetency of Gambier, who demanded a court-martial. Through influence and a friendly court, Gambier was exonerated, while Cochrane, discredited, was forced to retire on half pay. In Parliament Cochrane continued his unsparing criticism of naval corruption, and thereby he made enemies who were glad to encompass his downfall, when, through a French officer who had applied to him for service, and whom he delivered to justice, he was implicated in an attempt to influence the stock market by spreading the rumor of Napoleon's death. His uncle and another were found guilty and punished; and Cochrane, although innocent, was fined £1000, struck off the navy list, expelled from Parliament, degraded from his knighthood, sentenced to a year's imprisonment, and to stand for an hour in the pillory. Owing to popular indignation, the pillory punishment was omitted. His Westminster constituents remained his friends and reflected him. He escaped from jail in 1815, took his seat in the House, but was expelled by force, imprisoned for the rest of his term, and fined anew £100. Disgusted with vain attempts at justification, he accepted an invitation to organize the Chilean Navy, and in 1818 proceeded to Valparaiso. He put the wretched Chilean vessels into the best possible condition, and gained a series of remarkable successes over the Spanish fleet. In 1820 he took Valdivia and carried San Martin's army to Peru, having previously destroyed Spanish commerce on the Pacific coast, and performed a brilliant exploit in cutting out the Spanish frigate *Esmeralda* from under the enemy's guns at the Castle of Callao. Non-fulfillment of contracts and the refusal of arrears of pay caused him to resign, and soon afterwards he became admiral in the Brazilian Navy. During this appointment (1823-25) he compelled the Portuguese to evacuate Bahia, reduced Maranhão, and for his services received the marquisate of Maranhão; but the same causes as in the Chil-

ean service led to his resignation from the Brazilian. His next appointment was the command of the Greek Navy (1827-28); but an insufficiency of ships and men prevented the accomplishment of anything of importance. In 1831 he succeeded to the Dundonald peerage; in the following year, William IV. satisfied a general wish by granting him a free pardon for the offense of which he had been convicted, and in 1847 Queen Victoria reinstated him in the Order of the Bath and to his naval rank. In 1877 his heirs received compensation for his unjust condemnation in a restoration of eighteen years' loss of pay and allowances as a naval officer. From 1848 to 1851 he was commander-in-chief of the North American and West Indian stations, and became rear-admiral of the United Kingdom in 1854. To an advanced age he busied himself with scientific inventions for the navy, and early recognized the advantage of steam-power and of the application of the screw propeller to warships. He published: *Notes on the Mineralogy, Government, and Condition of the British West India Islands* (1851); *Narrative of Services in the Liberation of Chile, Peru, and Brazil* (1859); and an *Autobiography* (2 vols., 2d ed., 1860); the same completed by the eleventh Earl and H. R. Fox Bourne (2 vols., London, 1869). He died at Kensington, and was buried in Westminster Abbey. Consult: Fortescue, *Dundonald* (London, 1895), and Atlay, *Trial of Lord Cochrane Before Lord Ellenborough* (London, 1897).

COCINERO, kō'sè-ná'rō (Sp., cook). The name of various species of West Indian crévalle (q.v.).

COCK, THE. A primitive tavern or alehouse on Fleet Street, near Temple Bar, London, with decorations of the period of James I. It is a famous resort, and is well known through Tennyson's "Will Waterproof's Lyrical Monologue." The same name was borne by several other London taverns, of which one on Threadneedle Street was specially renowned.

COCKADE (Fr. *coarde* or *coquarde*, from *coq*, cock). A word first found in the works of Rabelais, and in the early part of the seventeenth century used to designate a cocked hat or cap set jauntily on the head. Later on, however, it acquired a more restricted meaning, and was applied to the clasp or knot of ribbon which decorated the loop or cock of the hat. The word is now employed to designate a rosette or knot of ribbon, leather, or other material worn on the hat as a badge or ornament. Cockades have always been used as party badges and insignia since the War of the Spanish Succession, when the red and white cockade was adopted by the French. In England the Stuart cockade was white, the Hanoverian was black, and frequent references to the rival colors are to be met with in the literature of the time. As early as 1767, a regulation in France provided that every French soldier should 'mount the cockade,' the color being white; and a later decree, in 1782, restricted the wearing of cockades to the military. From this period till the outbreak of the French Revolution the cockade was an exclusively military emblem, and 'to mount the cockade' was synonymous with becoming a soldier, both in France and England. After the meeting of the States-General of France in 1789, cockades of green were worn by the advanced party, but

these soon gave way to the more popular red, white, and blue—the tricolor of the Revolution. See **TRICOLOR**.

Every nation of Europe has its own cockade. In Germany, black, yellow, and white, and black, red, and gold have been used; in Austria, black and yellow; in Russia, green and white. In England the cockades worn are always black—the old Hanoverian color; but being used, generally, as part of the livery of coachmen and footmen, they have lost all special significance. Consult: *Genealogical Magazine*, vols. i-iii. (London, 1897-99); Racinet, *Le costume historique* (6 vols., Paris, 1888).

COCKAIGNE, kōk-ān'. A name given to an imaginary land of good things—of idleness, luxury, and perfect happiness. The word appears in a variety of spellings in English and French, and means the 'land of abundance.' In it the rivers flowed with wine, the houses were built of dainties, and cooked fowls offered themselves for eating. Its English synonym is 'lubberland.' It is the subject of a popular satirical poem of the thirteenth century, *The Land of Cockaigne*, and is a burlesque term applied to London and to Paris.

COCK AND THE FOX, THE. A modernized version of Chaucer's *Nun's Priest's Tale*—made by John Dryden and published, with other translations, under the title of *Fables*, in 1699, shortly before his death.

COCK'ATIEL (from Dutch *kakatielje*, from Port. *cacatillo*, *cacatello*, cockatoo). One of the small, long-tailed Australian parrots of the genus *Calopsitta*, sometimes called 'cockatoo parakeets,' or 'ground parakeets,' particularly the favorite cage-bird *Calopsitta Nova-Hollandia*. This pretty species is found wild nearly all over Australia, where it goes about in flocks, and nests in hollow trees. It is about 12 inches long, half of which belongs to the tail, which ends in two prolonged and sharply pointed feathers. "The prevailing hue is dark-gray, . . . the forehead and cheeks are lemon-yellow, while the feathers of the crest, which cannot be depressed, are yellow at the base and gray above. A bright patch of reddish orange on the ear-coverts occupies the middle of the yellow area, and the . . . wings are ornamented with a broad band of white." See **COCKATOO**, and Plate of **PARROTS AND PARAKEETS**.

COCK'ATOO' (Hind. *kākātāu*, Malay *kakātāu*, onomatopoeic from its cry). A bird of the family *Cacatuidæ*, of the order *Psittacæ* (q.v.). They are closely related to the true parrots, and by some ornithologists are regarded as merely a subdivision of that family. The bill is high and curved from the base, and the tail is long, broad, and rounded. The head is also large, and in the true cockatoos is surmounted by a crest of long and pointed feathers, with their tips directed forward, which can be erected and expanded like a fan or depressed at the pleasure of the bird. The true cockatoos (*Cacatua*) are generally whitish in color, often finely tinged with red, orange, or other colors. The name 'cockatoo,' however, is also commonly extended to nearly allied genera, as *Calyptorhynchus* and *Microglossus*, in both of which the plumage is generally dark, and to which belong the black cockatoos of Australia and of the Indian Archipelago.

COCKATOOS AND MACAWS



1. ROSEATE COCKATOO (*Cacatus roseicapillus*).
 2. WESTERN BLACK COCKATOO (*Calyptorhynchus stellatus*).
 3. BILL OF NO. 2—front view.

4. GREAT BLACK COCKATOO (*Microglossus aterrimus*).
 5. BLUE-FRONTED MACAW (*Ara chloroptera*).
 6. GREEN-WINGED MACAW (*Ara nobilis*).
 7. SLENDER-BILLED COCKATOO (*Lichmetis nasica*).

The genus *Microglossus*, one of which is the great black cockatoo or ara (q.v.) of New Guinea (*Microglossus alarrimus*), the largest of all the Psittaci, is remarkable for the structure of its tongue, which is cylindrical, tubular, capable of being greatly protruded from the mouth, and terminates in a cloven, horny tip. All the cockatoos are natives of the Philippines, New Guinea, and adjacent islands, and especially of Australia and Tasmania, where they formerly abounded, and were hunted for food by the natives. They live on fruits and seeds, insect larvæ, etc. Some of them are frequently to be seen in confinement in Europe, particularly the lesser sulphur-crested cockatoo (*Cacatua galerita*), which, although of comparatively tame plumage, is a general favorite on account of its docility. None of the cockatoos learn to speak many words. Their name is derived from their cry. See Plate of COCKATOOS AND MACAWS. Compare PARROT.

COCKBURN, Kōbūrn. Sir ALEXANDER JAMES EDMUND (1802-80). Baronet. Lord Chief Justice of England. Born December 24, 1802, the son of Alexander Cockburn, who was at one time British Minister to Colombia, he was brought up on the Continent, and in 1822 entered at Trinity Hall, Cambridge, and was called to the bar in 1829. He was very successful as a practitioner, and in 1841 was made a Queen's counsel. His early practice was largely in connection with election petitions, in which he was very successful. In 1847 he was elected to Parliament as a Liberal from Southampton, and distinguished himself by the ardor and eloquence with which he supported the vigorous foreign policy of Palmerston. From this time on his promotion was rapid. In 1850 he was appointed Solicitor-General, and in the next year was promoted to the Attorney-Generalship. In 1854 he was made recorder of Bristol; in 1856 he was appointed Chief Justice of the Court of Common Pleas, and in June, 1859, he became Lord Chief Justice of England. In 1858 he succeeded to the baronetcy of his uncle, the Dean of York. It fell to his lot, as a judge of the Queen's Bench, to conduct the trial of the celebrated Tichborne case (q.v.). His distinguished position as the head of the British bench was emphasized by his appointment in 1871 to represent Great Britain in the international court of arbitration convened for the settlement of the long-standing controversy between that country and the United States over the Alabama claims (q.v.). For a sketch of his life, consult the *Law Magazine* for 1851, page 193, and 4th series, vol. vi., page 191; also *Law Times*, vol. xx., pages 68-88.

COCKBURN, ALICIA, or ALISON RUTHERFORD (1712-94). A Scotch ballad-writer. In 1731 she was married to Patrick Cockburn, of Ormiston, an advocate, and subsequently became acquainted with Burns, Hume, Lord Monboddo, and other celebrities of the day. Her lyric, "I've Seen the Smiling of Fortune Beguiling" (to the air of "The Flowers of the Forest"), has long been famous. She was one of the belles of Edinburgh, a graceful dancer, and an indefatigable letter-writer. A relative of Walter Scott's mother, she all of her life sustained friendly relations with the poet and novelist.

COCKBURN, CATHERINA TROTTER (1679-1749). An English dramatist and philosophical

writer, born in London. She wrote several plays, among which may be mentioned: *Agnès de Castro* (1696); *Fatal Friendship* (1698); *Love at a Loss* (1701); and *Revolutions of Sweden* (1706). She is also known for her defense of the philosophy of Locke, and later for championing the views of Dr. Samuel Clarke. A collection of her prose works was published with a *Memoir* by Birch (London, 1751).

COCKBURN, Sir GEORGE (1772-1853). An English naval officer. His operations against Martinique brought about the surrender of that island in 1809. He was active in the war with the United States in 1812-15, planning and executing with General Ross the marauding expeditions along the shores of Chesapeake Bay, and burning the public buildings in Washington. His last noteworthy sea employment was to convey Napoleon to Saint Helena, where he remained in 1815-16 as governor and commandant. He rose to the rank of admiral, was several times returned to Parliament, and was one of the Lords of the Admiralty.

COCKBURN, GEORGE RALPH RICHARDSON (1834—). A Canadian educator and member of Parliament. He was born in Edinburgh, Scotland; graduated at the university there in 1857; studied for several months in Germany and France, and in 1858 went to Canada, where in 1861 he became principal of Upper Canada College, which office he held for twenty years. From 1887 to 1896 he was a member of the Canadian Parliament. He has always warmly advocated British imperial federation. In 1893 he was chief commissioner from Canada to the World's Fair at Chicago.

COCKBURN, HENRY THOMAS, Lord (1779-1854). A Scottish advocate and judge. He was born in Edinburgh in 1779, and was educated at the high school of Edinburgh and afterwards at Edinburgh University. He was called to the Scottish bar in 1800, and seven years later was appointed one of the advocates whose duty it is to assist the Lord Advocate in the prosecution of criminal offenders, but was dismissed after holding office four years. Not till the introduction of jury trial in civil causes into Scotland, in 1816, did Cockburn find opportunity for remunerative professional employment. His powers were better adapted for success with a popular than with a professional tribunal. Under the Grey Ministry of 1830 he was appointed Solicitor-General for Scotland; and four years later he was made one of the judges of the Scottish supreme civil and criminal courts, and took the title of Lord Cockburn. He died April 26, 1854, at his residence of Bonaly, in the neighborhood of Edinburgh.

Lord Cockburn contributed to the *Edinburgh Review* a series of articles on the reform of the Scotch legal procedure, which had considerable influence. Late in life he undertook the task of writing the biography of his friend Francis Jeffrey, the celebrated Scotch essayist and judge. This was published in 1852. Cockburn will be best remembered by the *Memorials of His Time*, which appeared posthumously in 1856. It is a kind of autobiography, into which have been interwoven numerous anecdotes illustrating old Scotch life, and numerous sketches of the men who composed the brilliant circle of Edinburgh society at the beginning of the nineteenth century.

For details of his life, consult his *Memorials of His Own Time*, and Chambers's *Biographical Dictionary of Eminent Scotsmen*.

COCKCHAFFER. See CHAFFER.

COCKER. A small dog. See SPANIEL.

COCKER, EDWARD (c.1631-75). An English engraver and teacher. He was born probably in Northamptonshire, and died in London. The first edition of his famous arithmetic (which was the first to confine itself to commercial questions only) was published posthumously in 1678, by John Hawkins. At one time it was thought (following De Morgan's belief) that Hawkins wrote this work, but the evidence is against this view. Its popularity lasted nearly a century, and its sale probably exceeded 100 editions. The expression 'according to Cocker' became proverbial through its frequent use on the title-pages of arithmetical treatises following his method. Cocker's chief works are: *Tutor to Arithmetic* (1664); *Compleat Arithmetician* (before 1669); *Arithmetic*, edited by Hawkins (1678); and numerous contributions to methods of calligraphy.

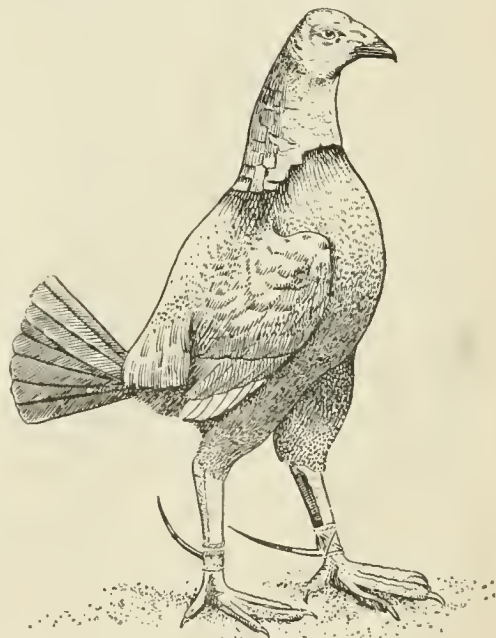
COCKERELL, kōk'ēr-el, CHARLES ROBERT (1788-1863). An English architect, born in London. In 1810-17 he visited Greece, Italy, and Asia Minor to study ancient architectural remains, made excavations at Ægina and other places, and enriched the British Museum with many rare and valuable fragments, notably from the temple of Jupiter Panhellenius at Ægina and Apollo Epicurius, near Phigaleia. He became surveyor of Saint Paul's Cathedral in 1819, chief architect of the Bank of England in 1833, and a member of the Royal Academy in 1836. From 1840 to 1857 he was professor of architecture in the Royal Academy. He was the designer of many public buildings, such as the Hanover Chapel in London, and the Taylor Buildings at Oxford. His works include: *The Temple of Jupiter Olympius at Agrigentum* (1830); *Ancient Sculptures in Lincoln Cathedral* (1848); and *Iconography of the West Front of Wells Cathedral* (1851).

COCKERILL, kōk'ēr-il, JOHN (1790-1840). An English manufacturer, born at Haslingden. With his brother, Charles, he established in Berlin a successful woolen-factory, and subsequently at Seraing, near Liège, Belgium, an iron-foundry and machine-shop, which became the largest on the Continent. King William I, of the Netherlands was for a time a partner in this business.

COCK'ERMOUTH. A town of Cumberland, England, at the confluence of the Cocker and Derwent, 25 miles southwest of Carlisle (Map: England, C 2). It is situated in an agricultural district, and in the vicinity are extensive coal-mines. On the left bank of the Cocker are the ruins of a castle built in the eleventh century and destroyed by the Parliamentarians in 1648. Near by is a tumulus, with a Roman camp and ditch, where many ancient relics have been found. The town was the birthplace of the poet Wordsworth. It has woolen and flax mills and manufactures hats, paper, hosiery, etc. Population, in 1891, 5464; in 1901, 5400.

COCK-FIGHTING. This is a sport of the highest antiquity, and to-day is the great pastime of millions, in the place of its origin, the far Orient, as well as a favorite sport in many

Western nations, including practically all Latin America. It is noted in the earliest records of China, it was a common pastime of the Persians long before the Greek invasion, it existed in ancient Rome, and Fitzstephen vouches for it in England in the twelfth century. Ascham, the tutor of Queen Elizabeth, was charged with being "too much given to dieing and cock-fighting," and is known to have had the intention of writing "a book of the Cock-pitte." Cock-pits existed in the metropolis of England (as they did in New York) well into the nineteenth century. Pierce Egan describes the Cock-pit Royal in Fulton Street, Westminster, as a large, lofty, and circular building with seats rising as in an amphitheatre. In the middle of it was a round, matted stage of about 18 to 20 feet in diameter, rimmed with an edge 8 or 10 feet high, to keep the cocks from falling over into the auditorium in their combats. There was a chalk ring in the centre of the matted stage, about a yard in diameter, and another chalk-mark within it, much smaller, which was intended for the setting-to when the birds become too exhausted to make hostile advances toward each other; they were then placed back to back within the inner mark. A large and rude branch candlestick was suspended low over the mat on the nights of battle. This description will practically suffice for all cock-pits.



GAME-COCK, WITH STEEL SPURS.

The origin of the breed of game-cocks is lost in an obscurity as dim as that of the origin of the sport. The jungle-cock of India may have been its progenitor; he has the constitutional instinct of fighting highly developed. To-day there are various strains—'Warhorses,' 'Fannie Carters,' 'Eslin Red Quills,' 'Arkansas Travelers,' 'Gordons,' 'Cotton Bolls,' 'Transatlantics,' and 'Hustlers,' are only a few of those which are favorites in the Carolinas, Virginia, and Georgia.

The 'Warhorse' strain is generally admitted to rank the highest, though 'Eslin Red Quills' and 'Gordons' run them close. The 'Warhorses' are the product of a cross between brown and black birds imported from Ireland, and called 'Irish Gelders,' and some dark-gray Irish birds. The resulting birds soon after their introduction fought all through the South, defeating the then fashionable 'Shawnecks,' 'Baltimore Topknots,' and 'Dominiques.' The breed is still maintained in its integrity, and its reputation has spread from the Southern States to Mexico. The cocks are mostly gray, and they are preferred to the red ones; the hens are nearly all jet-black.

The game-cock needs neither education nor experience to teach him to fight, and his capacity for giving and taking punishment till dead has passed into a proverb. The principal qualities to be desired are (1) cutting, i.e. the ability to hit with their heels, about every time they rise, and to rise every time their opponents do; (2) hard hitting—the blows of the heels driven home by the force of the wings applied to them as the cocks rise; (3) rapidity of fighting. Cocks may be good cutters which are not hard hitters, but disable or kill their antagonists without apparently heavy blows. Others are what are called wing-fighters, from making a great noise and shuffling with their wings, but scarcely using their legs at all; these are practically worthless.

A good breed is not the only prerequisite to victory: the birds must be judiciously strengthened and hardened by a course of diet and physical training to stand the great exertion necessary. This period used to extend over six weeks, but modern methods have reduced it to ten days, during which time they are restricted to a prescribed diet, and exercised in running and sparring. Then they are 'cut out,' i.e. have their wings trimmed to spread diagonally, the tail cut about one-third of the distance from the end, and the hackle and feathers about the rump shortened. If they fight with 'short heels' the gaffs or spurs are $1\frac{1}{2}$ inches long; if with 'long heels' $2\frac{1}{2}$ inches long; these gaffs or spurs are of steel, though some of the old aristocrats had them made of silver. The birds are matched by weight; those within two ounces of each other's weight are matches. The fights are conducted according to the local rules of the district, which vary considerably, although the variations are all modifications of the old English rules. Distinct sets of rules govern the United States and Canada; another set, England; yet others, France and Belgium.

When the pairs have been matched they are taken to the ring, examined and certified, and turned down to fight, on the ground (matted or carpeted or otherwise as the case may be). After that the setters-to are not to touch them, unless they either hang in the mat, or on each other, or on the edge of the pit, until they leave off fighting as long as a person can count a prescribed number aloud. Then the setters-to take up the cocks, carry them into the middle of the pit, deliver them on their legs, beak to beak. After each cessation of the combat, they are set to again in the same manner, and continue the fight until one cock refuses or is unable to fight, or is killed.

Large sums used to be staked, as much as \$5000 a match and \$25,000 a main having been

laid by the Earl of Derby in 1830. His birds are a famous breed to the present day. The Welsh main (now discontinued) was the most sanguinary form of fighting; as many as sixteen cocks would be matched; then the eight victors, then the four survivors, then the final two, until but a single cock remained alive.

During the latter half of the nineteenth century the sport of cock-fighting was made illegal throughout Great Britain. In America it is similarly prohibited in nearly all the States of the Union, either expressly or by laws for the prevention of cruelty to animals. In some States, where it is not forbidden by the statutes of the State, it is in some instances made illegal by local laws.

For early history, consult: Markham, *The Pleasures of Princes, or Goodmen's Recreations* (London, 1614); Fairfax, *Complete Sportsman* (London, 1764); Blain, *Rural Sports* (London, 1853).

COCK LANE GHOST, TIE. A supposed ghost, whose manifestations occurred in 1762 in Cock Lane, London, in connection with a young girl named Parsons and her parents. Investigation disclosed a conspiracy against a former resident, Mr. Kent, whose wife had died, and who was supposed to be accused by her ghost of murder. Parsons and his wife were punished. Among the investigators was Dr. Johnson, who described the mysterious occurrences in the *Gentleman's Magazine*, and who, because of his connection with the matter, was made the object of attack in Churchill's poem, "The Ghost." Consult Lang, *Cock Lane and Common Sense* (London, 1894).

COCKLE, kōk'l (Fr. *coquille*, shell, from Gk. *κογχύλιον*, *konchylion*, dim. of *κογχύλη*, *konchylē*, from *κόγχη*, *konchē*, shell, Lat. *concha*, Skt. *śankha*, shell), *Lychnis*. A genus of plants of the natural order Caryophyllaceae. The common cockle or corn-cockle (*Lychnis githago*) is a frequent weed among crops of grain, a native of Europe or the west of Asia, but now to be found in almost all parts of the world. For illustration, see Plate of CRANBERRY. It is an annual plant, clothed with long, white, appressed hair; three feet high, branched, with large, solitary, terminal reddish-purple flowers. The root, stem, leaves, and seed were formerly used in medicine; the seed is still sometimes sold in Germany under the name of 'black cumin' (Schwartz-kümmel). The corn-cockle is a very troublesome weed in some parts of Great Britain and the United States. The seed can hardly be screened from wheat, and in some localities millers reduce the grade of grain on account of the presence of cockle. Sowing clean seed is about the only means of combating it, aside from pulling the plants from the field.

COCKLE. A globose marine bivalved mollusk, especially of the family Cardiidae, often called 'heart-cockle' because, viewed endwise, the outline of the shell is like that of the ace of hearts. Cockles are usually gregarious, and vast numbers are found half-buried on sandy and muddy banks. The common European cockle (*Cardium edule*) is a valuable shell-fish, extensively sold in Great Britain; other species are less commonly eaten elsewhere. The number of known species is great; they are most numerous within the tropics, and particularly in the Indian Ocean, where some have shells very

beautiful in sculpture and coloring. The shell upon which Venus is represented, in ancient art, as riding upon the sea is a cockle; and several other genera, such as Venus, Cytherea, Selene, etc., are named in reference to this myth. Consult Lovell, *Edible Mollusks of Great Britain*, etc. (London, 1884); and see Colored Plate of CLAMS AND EDDIBLE MUSSELS.

COCKLEBUR, or **CLOTEUR**. A name given to the species of Xanthium, a genus of Compositae, of which there are but few species, but these are widely distributed. Three species are all too common in the United States—Xanthium spinosum (called spiny clotbur) and Xanthium strumarium, both of which were probably introduced from the Old World, and the native species, Xanthium Canadense. For illustration, see Plate of CORNFLOWER. They are coarse, annual, branching plants, one to three feet high, with alternate, rough, heart-shaped leaves. The stem is frequently spotted with brown or purple. The flowers are in separate groups, the female ones furnishing the well-known burs, which are about an inch long and covered with stout hooked prickles. These are troublesome to animals, especially to sheep, the wool of which is often seriously depreciated by their presence. The seeds contain two cells with an ovule in each. These retain their vitality for a long time, and both do not germinate in the same season. Being an annual, this weed can be exterminated if it be prevented from seeding for a number of years. In the south of Africa stringent laws for its eradication were enacted on account of the injury to the wool industry.

COCKLOFT, **PINDAR**. The *nom-de-plume* used by Washington Irving in *Salmagundi*.

COCK'NEY. A word of disputed origin, used as a general term for a Londoner, more specifically for one "born within the sound of Bow-Bells." It has been connected with cognac or cockaigne, and with the Thames, which is said to have been called the Cockney.

COCKNEY SCHOOL OF POETRY. A nickname which John Gibson Lockhart tried to fasten upon a school of writers, including Leigh Hunt, Keats, and Hazlitt, whom he thought vulgar. Their productions were said "to consist of the most incongruous ideas in the most uncouth language." Consult the articles "On the Cockney School," in *Blackwood's Magazine* (Edinburgh, October and November, 1817), where the expression was first used; also the article on Keats's "Endymion," in *Quarterly Review* (London, April, 1818).

COCK-OF-THE-PLAINS. See GROUSE.

COCK-OF-THE-ROCK (so called from building its nest on rocks). A remarkable bird of northern South America, representing a sub-family (Rupicolinae) of the cotingas, three forms of which are known. The most familiar is *Rupicola crocea*, inhabiting the Lower Amazon Valley; it is about the size of a large pigeon, almost purely orange in plumage, and has a remarkable flat-sided crest. Two other species (or varieties) are found higher up the Amazon, and in Ecuador. In each case the female is dull olive-brown and uncrested. They inhabit rocky water-courses and bushy hillsides, where they remain close to the ground and build their nests, largely of mud, on some rock. They are among the birds which court the females by assembling for

'dances' in certain cleared spaces, each displaying its showy plumage by queer antics until chosen by some observant hen.

Great numbers of these splendid birds are shot annually, as their skins not only command a high price for millinery purposes, but are much employed by the Indians in making a variety of beautiful decorations, and they are thus becoming rare. A large state mantle, formerly worn by the Emperor of Brazil, was entirely composed of their feathers; and in some districts of South America, it is said, the natives are, or were, compelled to bring a certain supply of skins as tribute. Their flesh is well-flavored, but of a very peculiar color, being bright orange-red. The cock-of-the-rock is much valued by residents of the Amazon Valley as a cage-bird. Consult Hudson, *A Naturalist in the La Plata* (London, 1892). See Plate of COINGAS.

COCK-OF-THE-WOODS. See CAPERCAILLIE.

COCKPIT. In old sailing men-of-war the apartment in which the wounded were placed during the engagement. It was ordinarily below the water-line on the orlop deck, and served, under ordinary circumstances, as a broad passageway to the storerooms on each side of it. At one time the warrant officers were quartered in the forward cockpit, and occasionally other officers, for whom there was no room on the decks above, were quartered in staterooms opening from the after one, where storerooms were ordinarily placed.

COCK-PIT, **THE**. A London theatre of the seventeenth century, changed from a cock-pit, on Cockpit Alley, the present Pitt Place. It was succeeded by the Phoenix Theatre, which in turn was replaced by the Drury Lane Theatre.

COCKRAN, kōk'ran, WILLIAM BOURKE (1854—). An American lawyer and politician. He was born in Ireland, was educated in that country and in France, shortly after his arrival in the United States, in 1871, was appointed teacher in a private academy, and subsequently became principal of a public school in Westchester County, N. Y. He studied law at the same time, was admitted to the bar in 1876, and soon took a prominent part as a Democrat in State politics. In 1882 he became counsel to the sheriff of New York City, and was reappointed in 1885. He was elected to Congress in 1886 and again in 1891; opposed the nomination of Cleveland for the Presidency; in 1896 supported McKinley; and in 1900, advocated the election of Bryan. He is an eloquent and polished, though somewhat florid, speaker.

COCK'RELL, FRANCIS MARION (1834—). An American lawyer and politician. He was born in Johnson County, Mo., graduated at Chapel Hill College in 1853, and practiced law for some time at Warrensburg, Mo. During the Civil War he served in the Confederate Army, in which he rose to the rank of brigadier-general, and since 1874 has been a Democratic member of the United States Senate.

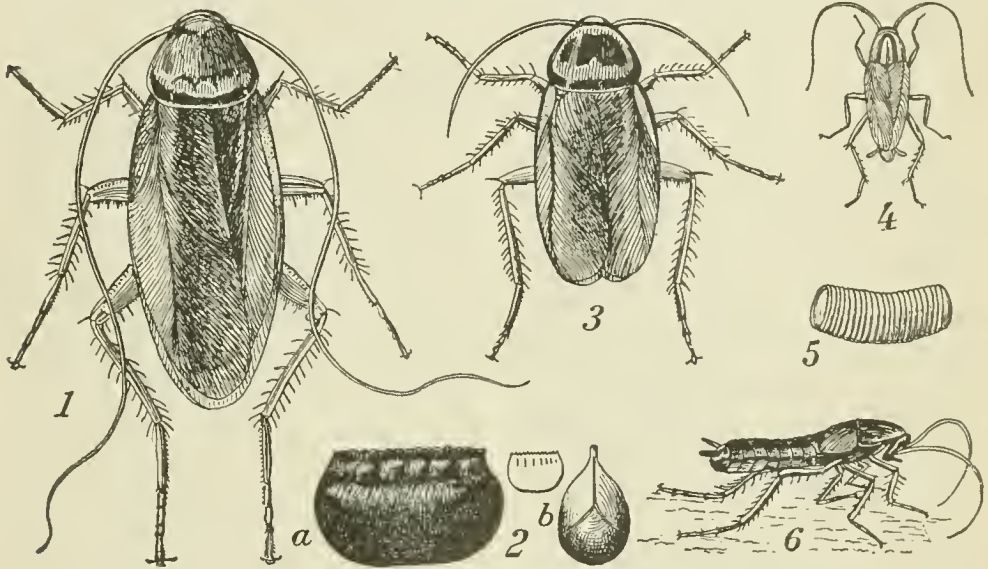
COCKROACH, or **ROACH**. An orthopterous insect of the family Blattidae, several species of which are household pests throughout the civilized world. Those most common are: (1) The Croton-bug (*Blatta Germanica*), so called from its becoming noticeable in New York when Croton water was introduced, but which is of

foreign origin, and of cosmopolitan range, having followed civilized man to all parts of the globe; it is of medium size, brown or yellowish, with wings, in the adult, extending beyond the abdomen. (2) The Oriental or proper cockroach (*Periplaneta Orientalis*) is also a widely distributed pest, introduced from the East. Although it is not at all related to the beetles (Coleoptera), its British name 'black beetle' well describes its dark, shining, robust appearance; its wings are characteristically shorter than the abdomen. (3) The American cockroach (*Periplaneta Americana*) probably originated in tropical America, whence it long ago spread to most of the seaport cities of the world; it is large and reddish brown, with very long wings. (4) The Australian cockroach (*Periplaneta Australasiae*), much like the American, but smaller. In addition to these, which frequent houses, bakeries, warehouses, and shipping, there are a large number of wood-cockroaches but rarely seen.

that they serve as scavengers to a small degree, and are the enemies of bedbugs.

Consult: for extended illustrated accounts of species above mentioned, Marlatt, *Household Insects* (Department of Agriculture, Washington, 1896; revised reprint, 1902); for general account of the Blattidae, De Saussure, *Mélanges Orthoptérologiques*, fascicule ii. (Geneva, 1878); for structure, Carpenter, *Insects: Their Structure and Life* (London, 1899).

Fossil Forms. During the latter part of the Paleozoic era cockroaches seem to have been very abundant, and to have formed the dominant feature of the insect life of that time. Their remains are present, though much less abundantly, in the Triassic rocks also, and some have been found in the Tertiary. The total number of fossil species is about 225, of which number 193 species are Paleozoic, and of these 133 are American. The Paleozoic cockroaches are as a rule larger, and have broader bodies than do the modern species. Their wings are quite common



COCKROACHES INFESTING HOUSES.

1, The American cockroach (*Periplaneta Americana*). 2, Egg-capsule or 'pod' of the same (somewhat enlarged); a, side view; b, end view; the dotted figure shows the natural size. 3, Australian roach (*Periplaneta Australasiae*); natural size. 4, Croton-bug, or German roach (*Blatta Germanica*); natural size. 5, Its egg-capsule; double size. 6, Oriental cockroach, or 'black beetle' (*Periplaneta Orientalis*); natural size.

Roaches as a group prefer warm, moist places. They go abroad mainly at night, and thus often escape notice even where they are abundant; and their excessively flattened body permits them to creep into very narrow crevices—below baseboards, in table-drawers, etc., where the eggs ('nits') are laid, surrounded by a peculiar 'pod;' but they are often carried by the female until nearly ready to hatch. The new-born young have nearly the same shape as the adult, but are wingless and pale in color. They are practically omnivorous, injuring all kinds of provisions, eating parts of books, blackened boots, and even the nails and eyelashes of sleeping children. The loss caused to provisions by their appetite is far surpassed by the remaining food being rendered unfit for human use, on account of the nauseous 'roachy' odor noticed wherever they congregate in large numbers. Their only claim to credit is

in the shales of the Coal Measures and Permian at several localities, such as Richmond, Ohio; Cassville, W. Va.; Mazon Creek, Ill.; and Commeny, France. At a few localities the larval forms (nymphs) have been found and described under the generic name *Dipeltis*. The cockroach wings of the Coal Measures are usually found in shales that are replete with the leaves of ferns. One of the commonest ferns is *Neuropteris*, and the insect's wings so closely resemble the leaflets of this fern that the likeness has been remarked upon and explained as a case of protective mimicry, adopted by the insect to enable it to elude its pursuers by hiding among the fallen fern-leaves.

For a full history of these insects, with recommendations for their suppression as a pest, consult: Howard and Marlatt, "Principal Household Insects of the United States," in *United States Department of Agriculture, Division of Entomol-*

ogy Bulletin 4, new series (Washington, 1896); also Maill and Denny, *The Structure and Life History of the Cockroach* (London, 1887).

COCKS, RICHARD. A grocer and merchant-adventurer of Coventry, England. He was one of the charter members of the East India Company (1600), merchant at Bayonne, France (1603-08), and one of the seven Englishmen who accompanied Capt. John Saris to Japan, on the first voyage of Englishmen thither. He established the British factory on the island of Hirado in 1613, and began June 1, 1615, to keep a journal, which is now of the greatest value as a contribution to the history of Japan and the foreigners there during the first quarter of the century, and as a picture of manners and customs. The *Diary* ends March 24, 1622. The great hope of the English was to open commerce with China, but they could not successfully compete with the Dutch, who undersold them, and in the end starved them out of the country. In April, 1623, the dissolution of the English factory was decided upon, and Cocks and the other Englishmen arrived at Batavia January 27, 1624. Cocks made many travels through Japan, even to Yedo, meeting Iyeyasu and many native notables and the Korean Embassy. He introduced white potatoes into Japan from Java, and 'Java potato' is still the name applied to this tuber by the Japanese. The diary of Richard Cocks, carefully edited and annotated by Edward Maunde Thompson, with introduction and index, was published in two handsome volumes by the Hakluyt Society (London, 1883).

COCKSCOMB (from its crest, resembling the comb of a cock), *Celosia cristata*. An annual plant of the natural order Amarantaceae, a native of the tropics, and formerly much grown in greenhouses and gardens. It grows with an upright stem, which becomes flattened upward, divides, expands, and forms a sort of wavy crest, covered with pointed bracts, and bearing on its surface many very small flowers. There are both tall and dwarf forms, and a number of colors of each. The plant is of easy cultivation. See AMARANTH.

COCK'S-FOOT GRASS. See ORCHARD GRASS.

COCKSPUR GRASS. See BUR GRASS.

COCKSPUR THORN. See CRATEGUS.

COCKSWAIN. See COXSWAIN.

COCK'TON, HENRY (1807-53). An English humorous novelist, born in London. His works, of which *Valentine Vox*, *the Ventriloquist* (1840), is the best, were very successful in their day. *Stanley Thorne* was illustrated by so distinguished a trio as George Cruikshank, Alfred Crowquill, and John Leech.

COCLE, kō'klēz. HORATIUS, 'the one-eyed.' One of the mythical heroes of ancient Rome. Aided by Lartius and Herminius, he defended the Sublician Bridge against a great army under Lars Porsena, keeping the enemy at bay until the Romans behind them destroyed the bridge. When the bridge was about to fall, Cocles sent his two companions back; and when it had fallen, sheathing his sword and praying the river to favor him, he plunged in and swam safely to the shore. He received for a reward as much land as he could draw a plow around in a day, and a statue in the Comitium. No hero was held in higher honor, and Roman writers never wearied of tell-

ing what Macanlay repeats in his spirited *Lays of Ancient Rome*, "How well Horatius kept the bridge, in the brave days of old."

COCOA, kō'kō. See CACAO.

COCOA BUTTER. A pure white solid fat, obtained from the seeds of *Theobroma Cacao*, having a specific gravity of .945 to .952. It is used in cosmetics and other pharmaceutical preparations, and in the manufacture of confectionery. See CACAO; OILS.

COCOANUT, or COCONUT (Fr. *coco*, Gk. *κοῦκι*, *kouki*, cocoa-tree, from Anc. Egypt. *kuku*, cocoa-tree). The well-known fruit of a species of palm (*Cocos nucifera*), perhaps originally a native of the Indian coasts and South Sea Islands, although there is evidence of its prehistoric occurrence on the west coast of Central and South America. (For illustration, see Plate of PALMS.) It is now diffused over all tropical regions. The coconut palm belongs to a genus having pinnate leaves, and male and female flowers on the same tree, the female flowers at the base of each spadix. There are about 30 known species, nearly all of which are natives of South America. Many of the species prefer dry and somewhat elevated districts. The coconut palm, on the contrary, is seldom found at any considerable distance from the seacoast, except where it has been introduced by man, and generally succeeds best in sandy soil near the sea. It is always one of the first of the larger plants to establish itself in the low islands of the Pacific Ocean, as soon as there is soil enough. It has a cylindrical stem, about 2 feet in diameter, and from 60 to 100 feet high, with many rings marking the place of former leaves, and bearing at its summit a crown of from 16 to 20 leaves, which generally curve downward, and are from 12 to 20 feet in length, with numerous leaflets, 2 to 3 feet long. The flowers proceed from within a large pointed spathe; the fruit grows in short racemes, which bear, in favorable situations, from 5 to 15 nuts; and 10 or 12 of these racemes, in different stages, may be seen at once on a tree, about 80 or 100 nuts being its ordinary annual yield. The tree bears fruit in from seven to eight years from the time of planting, and continues productive for seventy or eighty years. Of the three round, black scars at one end of the shell, the largest one through which an opening is commonly made to get out the *milk* is the destined outlet of the germinating embryo, which is situated there, the kernel consisting generally of the endosperm destined for its nourishment. The thick husk is remarkably adapted to the preservation of the seed, while the nut is tossed about by the waves, until it reaches some shore far distant from that on which it grew.

The coconut affords to the inhabitants of many tropical coasts and islands a great part of their food; it is not only eaten as it comes from the tree, both ripe and unripe, being filled in a young state with a pleasant, milky fluid, but is also prepared in a variety of ways, as in curries, etc.

The kernel of the coconut contains more than 70 per cent. of a fixed oil, called coconut oil, or coconut butter. The oil is itself an important article of commerce, being much employed for the manufacture of 'stearin candles,' and also of a 'marine soap' which forms a lather with

sea-water. It is also employed as an article of food, so long as it remains free from rancidity—to which, however, it is very liable. It is obtained by pressure of the bruised kernel, or by boiling over a slow fire, and skimming off the oil as it floats on the surface. A quart, it is said, may be obtained from seven or eight cocoanuts. It is liquid at the ordinary temperature of tropical countries, but in colder climates becomes a white, solid, butter-like oil. It becomes liquid about 74° F. It can be separated by compression into a liquid portion called 'olein,' and a more solid part termed 'stearin,' or 'cocosin,' which is of complex constitution. The cake resulting from the pressure of the endosperm for its oil is an important cattle-food. Cocoanut oil is not a good lamp-oil, as it chars on the wick and burns with a smoky flame.

The root of the cocoanut palm possesses narcotic properties, and is sometimes chewed instead of the areca-nut. When the stem is young, its central part is sweet and edible; but when old, this is a mass of hard fibre. The terminal bud (palm-cabbage) is esteemed a delicacy, and trees are often cut down for the sake of it. The saccharine sap of the flower-spathes before they open is a source of toddy and palm wine, and by distillation the liquor arrack. In the East Indies the juice is often boiled down to yield sugar (jaggery).

The dried leaves of the cocoanut palm are much used for thatch, and for many other purposes, as the making of mats, screens, baskets, etc., by plaiting the leaflets. The midribs of the leaves supply the natives of tropical coasts with oars. The wood of the lower part of the stem is very hard, takes a beautiful polish, and is employed for a great variety of purposes, under the name of porcupine-wood. The fibrous centre of old stems is made into cordage. By far the most important fibrous product of the cocoanut-tree is coir (q.v.), the fibre of the husk of the somewhat immature nut. If the nuts are allowed to ripen, the coir is coarser and more brittle. The husk of the ripe nut is used for fuel, and also, when cut across, for polishing furniture, scrubbing floors, etc. The shell of the cocoanut is made into cups, goblets, ladles, etc., and is often finely polished and elaborately ornamented by carving.

Cocos butyracea, one of the South American species of this genus, is a very large tree, and its nut abounds in an oil and butter of similar quality to that obtained from the cocoanut. The double cocoanut of the Seychelles Islands is the fruit of a palm of a different genus (*Lodoicea sechellarum*). *Cocos Weddellianum* is the species most commonly cultivated in greenhouses and in the open as an ornamental. For illustration, see PALMS.

COCOANUT or ROBBER CRAB. A large terrestrial macrurous crab (*Birgus latro*), of the East Indies, which feeds on cocoanuts. Although allied to the hermit, it has the abdomen symmetrical and covered above, with a series of bony plates, so that it requires no borrowed shell or other artificial protection. It is found in the islands of the Indian and South Pacific oceans, and may reach a size larger than that of any other land crab, enabling it to handle the largest nuts; and Forbes says that "one of its pincer-claws is developed into an organ of extraordinary power, capable, when the creature is enraged, of

breaking a man's arm." Its flesh is edible. It digs and inhabits burrows and long tunnels, lined with fibres stripped from cocoanuts. In these it lurks during the day, going abroad, as a rule, only at night. It feeds mainly upon fallen cocoanuts, not gathering them from the trees, as has been asserted, although it often climbs into the palms. "To get at the contents of the nut, the crab first tears away the fibre overlying the three 'eyes,' and then hammers away with its claws at the latter until a hole is made, when it extracts the kernel by means of its smaller pincers." This crab has its gills so modified as to function as lungs. It occasionally visits the water, and periodically resorts to the sea to spawn, where the young pass through their developmental stages in the water like other crabs. Several species are known. Consult: Darwin, *A Naturalist's Voyage* (London, 1860); Forbes, *A Naturalist's Wanderings in the Eastern Archipelago* (New York, 1885). See PLATE OF CRABS.

COCOA-PLUM. An edible drupaceous fruit growing on a shrub (*Chrysobalanus icaco*) of the order Rosaceae, in Florida and the West Indies. It is yellow, purple, or black, and is much like a large plum in appearance. The skin is thin, and the sweet white pulp adheres firmly to the stone.

COCOA-ROOT. See COCCO.

COCOA-TREE CLUB, THE. A London club, developed about the middle of the eighteenth century from the Tory Cocoa-Tree Chocolate House, which flourished during the reign of Queen Anne. It was a gathering place of Jacobites, and was frequented by many leading men of the day.

COCOMA, kô-kô'mâ. An important tribe of Tupian stock, anciently living at the junction of the Hualaga and Marañon (Amazon), but now lower down at Nauta, at the entrance of the Ucayali, northeastern Peru. Before the Jesuits established missions among them, about 1680, they had the custom of eating their dead relatives and grinding their bones to powder to drink in a native liquor, assigning as a reason that "it was better to be inside a friend than to be swallowed up in the cold earth." They are described as shrewd, provident, and industrious, good boatmen, and braver fighters than most of the civilized Indians.

COCONUT. See COCOANUT.

COCOON' (from Fr. *cocoon*, dim. of *coque*, shell, from Lat. *concha*, shell). The pupa-case of an insect. See INSECT; BUTTERFLIES and MOTHS; and ANT.

COCO'PA. An agricultural tribe, supposed to be of Yuman stock, formerly holding the country about the mouth of the Colorado River and the head of the Gulf of California, in Mexico, and sometimes ranging northward into Arizona. They still number about 500, but are rapidly wasting away from contact with American civilization. Their present habitat is on the Colorado River from the Gila to its mouth.

CO'CO RIVER, WANKS, or SEGOVIA. A river in Central America, forming a portion of the boundary line between Honduras and Nicaragua (Map: Central America, M 5). It runs in a generally northeasterly direction, and enters the sea at Cape Gracias a Dios. Its total length is about 300 miles, and it is navigable through a portion of the course.

COCY'TUS (Lat., from Gk. *Κοκυτός*, *Kōkytos*, river of wailing, from *κωκυεύω*, *kōkyein*, to wail, Skt. *kū*, to cry). A tributary of the Acheron in Epirus, now called *Βαβύς*, *Bābos*. Coeytus was also the name of a river of the infernal regions, a branch of the Styx.

COD (origin obscure; possibly from *cod*, shell, husk, or from Flem. *kodde*, club, from the rounded shape of the fish). A fish (*Gadus callarias*) of the family Gadidae, which almost rivals the herring in its importance to mankind. The body is elongate, slightly compressed, and tapers toward the tail, so that with the rather large head it appears heavy anteriorly. The body is covered with small scales. There are three dorsal and two anal fins. From the end of the lower jaw hangs a well-developed barbel. The general color varies greatly, being greenish, brownish, or even yellowish and reddish. The back and sides have numerous round, reddish-brown spots. The fins are dark. It will attain a weight of four to five pounds in about three years, and may ultimately reach a weight of 150 to 200 pounds, but the usual weight of large specimens is from 15 to 30 pounds.

The home of this fish is in the shallower parts of northern seas. "The southern limit of the species," on the American side of the Atlantic, according to Goode, "may safely be considered to be Cape Hatteras, in latitude 35° 10'. Along the coast of the Middle States, New England, and British North America, and upon all the offshore banks of this region, cod are usually found in great abundance during part of the year at least. . . . and it is more than probable that they occur in the waters of the Arctic Sea to the north of the American continent." It no doubt extends around the northern shore of the continent to Bering's Strait, and thence into the North Pacific, for the cod of the coastal waters and shallows off Alaska, Siberia, and thence down to Vancouver Island and Japan are the same in appearance and habits, and probably specifically identical. On the European side of the Atlantic it frequents the Scandinavian and Spitzbergen coasts, the North Sea, and the waters about Great Britain and Iceland. Its favorite haunts are the ocean banks, down to about 120 fathoms, but it frequently approaches close to the coast, enters bays, and ascends the estuaries of large rivers. It is a powerful swimmer, predatory, having strong teeth upon the vomer, and one of the most voracious denizens of the sea. It eats anything and everything it can, capturing other fishes, squids, etc., in large numbers, and devouring great quantities of deep-sea clams, which it swallows whole. The stomachs of cods have supplied to conchologists great numbers of rare shells, and before the days of deep dredging many conchological specimens were obtainable only in this way.

These fish are very prolific, 9,000,000 eggs having been taken from a single female weighing 75 pounds. The spawning season lasts from October to April, but the eggs of any given female do not all ripen at once. "Impelled by the spawning instinct, the cods seek the shoal waters of the coast or banks in shoals consisting of both sexes." Here the eggs are extruded, float to the surface, and toss about until they hatch, and the fry escape to become the prey of innumerable foes. It appears, however, that many (some say most) cod void their eggs in deep

water, whence they rise and drift toward the shore. The destruction of eggs and young through various agencies must be very large; since, in spite of the enormous numbers produced, comparatively few reach maturity, so that the number of cod is limited, and liable to be materially reduced by persistent fishing. This diminution began to be felt, in fact, long ago, the cod almost disappearing from easily accessible inshore resorts, so that the fishermen have been obliged to go to the more distant oceanic banks. To compensate for this loss, the species has long been extensively propagated, both in Europe and America, more than 100,000,000 fry having been hatched and planted during the year 1897 alone by the United States Fish Commission. For the methods and results of these efforts, see FISH-CULTURE; for the methods, extent, and value of the products of cod-fishing, see FISHERIES; and for portraits of important species, see Plate of CODFISH AND ALLIES.

Several other species, important as food, belong to this family, such as tomcod, haddock, ling, etc., which are elsewhere described. The 'codfish' of the San Francisco markets, however, is an entirely different fish, a chirid (*Ophiodon elongatus*), for which see CULTUS-COD.

For the most complete history of the cod family, consult G. Browne Goode, in *Fisheries and Fishery Industries of the United States*, Tenth Census (Washington, 1884), in which other books are mentioned. See COD-LIVER OIL.

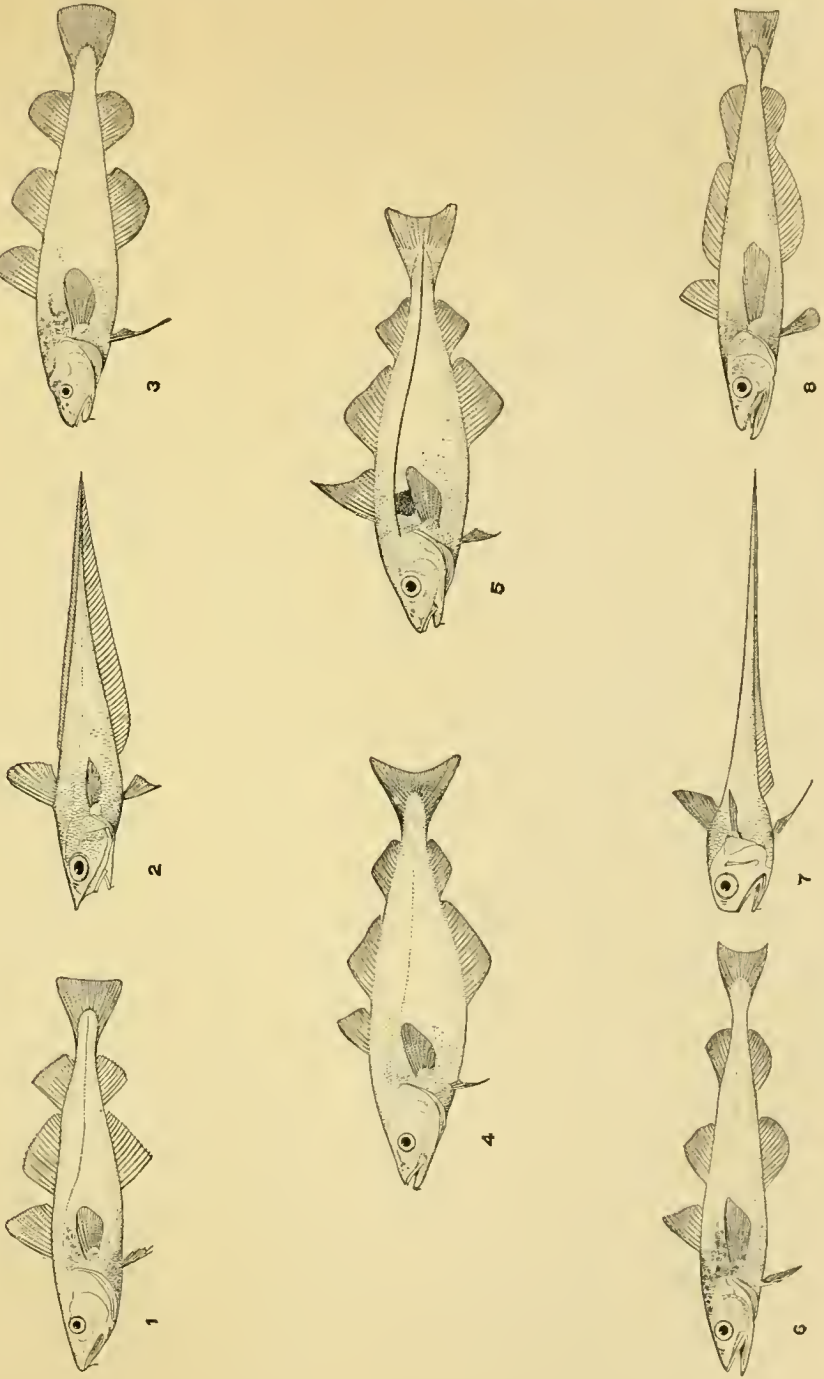
COD'A (It., tail, end). The concluding passage of a musical composition. Originally a single phrase intended as a winding-up cadence, it grew in importance in the sonata, rondo, etc., becoming in some cases an independent movement.

CODAZZI, kō-dāt'sē, AGOSTINO (1792-1859). An Italian traveler, engineer, and geographer, born at Lugo, near Ferrara. He entered the army as a volunteer, and afterwards set up as a merchant at Constantinople, whence he made extensive journeys through Europe. In 1817 he went to the United States. He served in the Venezuelan Revolutionary Army, and later entered the Colombian service, in which he rose in 1826 to be a lieutenant-colonel. From 1831 to 1838 he prepared maps of the State of Venezuela, being compelled, for the purpose of topographical surveys, to explore the deserts of Guiana, and to penetrate nearly to the sources of the Orinoco. The results of this undertaking he published in Paris in 1841, under the title *Resumen de la geografia de Venezuela* (with an atlas). He subsequently made surveys of the Isthmus of Panama, with reference to the possibility of an interoceanic ship-canal.

CODDE, kōd'de, PIETER (c.1598-1678). A Dutch painter, born in Amsterdam. He is of the school of Frans Hals, and is known to have completed one of the latter's pictures. His subjects, generally groups of people drinking, singing, or dancing, are brilliantly painted and have much spirit. The best of them is "The Ball" (1633). His treatment of costume is especially good. It is only recently that his works have been clearly identified and their value understood.

COD'DINGTON, WILLIAM (1601-78). One of the founders, and the first Governor, of the Colony of Rhode Island. He was born in Boston,

CODFISH AND ALLIES



- 1. CODFISH (*Gadus callarias*),
- 2. A PELAGIC GADOID (*Cœlorhynchus carminatus*),
- 3. TOMCOD (*Microgadus tomcod*),
- 4. POLLOCK (*Pollachius virens*),

- 5. HADDOCK (*Melanogrammus aeglefinus*),
- 6. ALASKAN POLLOCK (*Theragra chalcogramma*),
- 7. A MACRURID (*Hymenocephalus caveriosus*),
- 8. SILVER HAKE (*Merluccius productus*),

Lincolnshire, England; came to Plymouth Colony in 1630 with a commission as magistrate, landed at Salem, and was for some time a trader in Boston. He undertook the defense of Ann Hutchinson, and opposed similar persecution in other cases, but without success. In 1638, with eighteen others, he removed to the island of Aquidnek (later Rhode Island), and founded a colony which was to be "judged and guided by the laws of Christ." Coddington was elected Governor in 1640, and held the office until the Colony was incorporated in the charter with Providence Plantations in 1647. He went to England in 1649, and two years later obtained a commission to govern Aquidnek and Conanicut for life. His opponents in the Colony, through Roger Williams and John Clark, succeeded in having this revoked (1652); but Coddington did not finally submit until 1655. He became a Quaker in 1666, and from 1674 until his death was again in office as Governor. He left a work entitled, *Demonstration of True Lore unto the Rulers of Massachusetts* (1674). Consult "William Coddington in Rhode Island Colonial Affairs," No. 4 of the *Rhode Island Historical Tracts* (Providence, 1898).

CODE (from Lat. *caudex* or *codex*, trunk of a tree, tablet for writing). The word *code* is often loosely employed to describe: (1) A set of rules of any sort, as when we speak of the moral code or of the code of honor. (2) Any compilation of legal rules, from a collection of early customs like the Salic law down to the building laws of a modern municipality.

As a modern legal term, the word *code* (Fr. *code*, It. *codice*, Sp. *código*, Ger. *Gesetzbuch*) may be defined as an orderly presentation, in statutory form, of some distinct branch or fairly extensive portion of the law. On the Continent of Europe and in Latin America there are regularly in each State: (1) A civil code, setting forth the law of persons, domestic relations, property, obligations, and succession; (2) a commercial code; (3) a penal, or criminal, code; (4) a code of civil procedure; and (5) a code of criminal procedure. Systematic arrangements of other and less extensive portions of the law, resembling the English Consolidation Acts, are sometimes termed codes, but more commonly laws. For European and Latin-American civil codes, see paragraph VIII. of the subtitle *History*, in the article *CIVIL LAW*.

In Great Britain, the statutes of the realm have been revised by eliminating obsolete and repealed enactments (Revised Statutes, 1870, 1885); and statutes relating to certain subjects have been brought together in consolidation acts, of which, perhaps, the most important are the statute-law revision and civil-procedure acts of 1881 and 1883; but the only important acts in which the statutory and common-law rules relating to a given subject have been combined are: The Bills of Exchange Act (1882); the Partnership Act (1890); and the Sale-of-Goods Act (1893). In British India codification has been carried much further. Not only have the general and provincial statutes been revised, but there are codes of civil and criminal procedure (1859 and 1861, new codes 1882 and 1898), a penal code (1860), and acts nearly equivalent to codes governing contracts (1872), and transfers of property, easements, and trusts (1882). Ceylon and the Straits Settlements have adopted

or adapted some of the Indian codes. Canada, New South Wales, Victoria, New Zealand, and Queensland have criminal codes.

In the United States the general or public statutes of the Federal Government, and those of a great majority of the States, are periodically revised, and these revisions are sometimes called codes. When (as is usually the case) the revision is passed by the Legislature, it replaces the original acts. The Revised Statutes are grouped according to the subjects with which they deal, and the arrangement of subjects is sometimes systematic, but more often alphabetical. Under either arrangement these compilations ordinarily contain more or less complete codes of criminal law and procedure, and sometimes codes of civil procedure. Nearly one-fourth of the States have separate codes of procedure; a small number have separate penal codes. The Revised Statutes rarely include anything approaching a complete civil code, and only four States (California, Louisiana, North Dakota, and South Dakota) have separate codes of this character: for in most of the States the substantive private law, especially the law of personal property and of contracts, is still in the main common law. In Louisiana, where the common law has never obtained, there has been a civil code since 1808; but no State has yet passed a civil code which completely supersedes the common law. The first attempt to combine common and statutory law in a civil code was made in Georgia in 1860, in connection with a general revision of the law; but this code was not meant to be a complete enactment of the common law. Iowa, Ohio, and Texas have gone further than most of the other States in enacting common-law rules, but not so far as Georgia. The nearest approach to a complete enactment of the common law is found in a civil code which was drafted in New York, but which was not adopted in that State. It was adopted in the Territory of Dakota, 1865, and in California, 1872; and many of its provisions have passed into the laws of Montana, Utah, and Wyoming. This code, although frequently revised, has not completely superseded the common law. Consult *Estate of Apple*, 66 Cal. 432.

The question of codification, in England and in the United States, is practically a question of the advisability of transforming common law into statutory law. The conditions are different from those which have prevailed on the Continent of Europe. There the earlier modern codifications were provincial; and they were made partly to protect existing customs against the Romanizing tendencies of the courts, and partly to substitute, for the Roman laws, civil and canon laws written in the vernacular. The great codes now in force in France, Italy, and Germany were constructed to replace the earlier local provincial and State codes and to establish uniform national law. The codification movement in Switzerland has the same purpose: it proposes to substitute federal law for cantonal law. (See *CIVIL LAW, History*, VIII.) In England the existing common law is national, and codification by act of Parliament will simply change its form and the mode of its future development. In the United States, also, the common law is national; but inasmuch as the United States Congress cannot codify the common law for the States, codification is possible only in the form of State codes;

and even if the State codes were uniform at the outset, it would be impossible to keep them uniform. Codification in the United States accordingly means the deliberate creation of a diversity of laws similar to that which has made national codification necessary in Europe. An opposite movement, toward uniformity, is represented in the United States by the Negotiable Instruments Act, drafted in 1896 by commissioners from the several States and already enacted in a considerable number of States and Territories.

BIBLIOGRAPHY. Bentham's works, especially his *View of a Complete Code of Law* (Edinburgh, 1843); Savigny, *The Vocation of Our Age for Legislation and Jurisprudence* (1814; trans. by Hayward, London, 1831); Field, *Speeches, Arguments, and Miscellaneous Papers* (New York, 1884-90); Carter, *Proposed Codification of Our Common Law* (New York, 1884); *Provinces of the Written and Unwritten Law* (New York, 1889); Dillon, *Our Legal Chaos* (New York); F. J. Stimson and Munroe Smith, "Statute and Common Law," *Political Science Quarterly*, vols. ii. and iii. (New York, 1888-89); Ibert, *Legislative Methods and Forms* (London, 1901).

CODE NAPOLÉON. Properly, the entire body of French law as contained in the so-called Five Codes promulgated between 1804 and 1810. In general usage, however, the term is restricted to the first of these, the code of civil or private law enacted in 1804 and still in force. The relation of this code to the general development of European law is indicated in **CIVIL LAW, History**, VIII. At the outbreak of the Revolution (1789) there was great diversity in the laws by which different parts of France were governed, and the establishment of a general or national code was one of the reforms urgently demanded. Such a code was promised in the Constitution of 1791, and the Convention caused a code to be draughted in 1793; but this draught was rejected because it contained "no new and grand ideas, suitable to the regenerated France." It was not until the revolutionary storm had spent its force and Napoleon, as First Consul, had established a strong government that the work could be pushed through. In July, 1800, the task was intrusted to a commission consisting of the most eminent jurists in France, chief among them being Bigot-Préameneu, Malleville, Portalis, and Tronchet. These men completed their work in four months. After the proposed code had been approved by the principal courts of justice, it was discussed in the Council of State, where Napoleon displayed great interest in the work and made many shrewd suggestions, and it was then submitted, title by title, to the legislative body. Here it encountered opposition, because it was considered too conservative; and it was not passed until the legislature had been reformed into docility. The entire code was promulgated March 21, 1804, as *Code civil des Français*. In 1807 the title was changed to Code Napoléon. These two designations have since prevailed alternately, according to the form of government. After the completion of the civil code, other codes were adopted, dealing with civil procedure, penal law, criminal procedure, and commerce.

The Code Napoléon introduced little new law. It was a compromise between the customary law of the northern provinces, which was substantially German, and the law of eastern and south-

ern France, which was mainly Roman. It consists of three 'books.' The first deals with persons, including family relations. The second deals with rights in things, but does not include the law of pledge and mortgage. The third, entitled "Various modes of acquiring ownership," includes succession, by testament and *ab intestato*; matrimonial property law; the law of liens and mortgages; and the rules regarding proscription.

The great merits of the code are simplicity (sometimes secured by superficiality) and clearness of statement. In spite of these merits, the code has aroused the usual amount of controversies, some of which are still unsettled, and has required no little judicial interpretation. To contemporary jurists it seemed fairly complete; but experience has revealed many 'open places' which have been filled, in part by judicial decisions and in part by supplementary legislation. There has been also considerable legislative amendment.

The Code Napoléon, as a result of French conquests, was introduced before 1814 into many parts of central and southern Europe. In most instances independent national codes have since been substituted; but the Code Napoléon is still in force in Belgium, in Holland, in several Swiss cantons, and in Italy the newer codes are largely based upon the French. The same is true of the code of Louisiana, of most of the Central American and South American codes, and of the Spanish Code of 1889. The Code Napoléon is contained in Roger and Sorel, *Codes et lois usuelles* (15th ed. Paris, 1883). There are commentaries by Marcade and Pont, *Explication théorique et pratique du code civil* (Paris, 1874-94); Mourlon, *Répétitions écrites sur le Code Napoléon* (12th ed. Paris, 1885).

CODEINE (from Gk. κώδεια, *kōdeia*, a poppy-head), $C_{17}H_{19}NO_5$. One of the alkaloids found in opium, in which it exists in relatively small quantities. In chemical constitution it is closely allied to morphine, from which it is now usually prepared. Its physiological action is similar to that of morphine, and it is used in medicine to diminish sensibility to pain; it is also sometimes prescribed in diabetes. Codeine is a white crystalline substance sparingly soluble in water, freely soluble in alcohol, ether, chloroform, and other organic liquids. It may be readily identified by dissolving a small quantity in strong sulphuric acid and adding a trace of ferric chloride solution, which produces a blue coloration. The medicinal dose of codeine is from one-quarter to two grains.

CO'DEX (Lat., trunk of a tree, tablet). The name 'codex' seems to have been applied first to books that were made by laying sheets one on another, like tablets, in sets of three, four, or more. Each one of such sets, when folded and stitched together, constituted a book (liber) in the more technical sense. Any number of these 'books' might be bound together in a large book or codex. In distinction from the codex, the volume or roll was made by pasting or stitching the separate sheets together edgewise, thus forming a long ribbon which had to be rolled in order to be easily handled.

The word is at present used almost exclusively for manuscript copies of the whole or parts of the Bible or of the Greek and Roman classics.

Some of the most important of the former are noted in the article on the New Testament text. (See BIBLE.) About A.D. 200 the codex form began to supplant the roll form. The earlier codices appear to have been larger than the later ones. It was perhaps in imitation of the appearance of the open roll, with its several parallel columns of reading matter, that the early codices were written with three or even four columns on a page. Later it was more usual to write but two, and finally but one. Codices were of either paper or parchment—of various grades—the latter being always the more common. The oldest codices were written in uncial script—that is, in semi-capitals; the letters being, as a rule, separate from each other. They are without word-divisions, punctuation, breathings, or accents. The separate books have only the simplest titles. In the fifth and sixth centuries the text was broken up into large sections beginning with large capital letters, accents and breathings were introduced, the titles enlarged, and more or less of introductory matter added. Some slight attempts at decoration were also indulged in. Late uncial codices, from the seventh to the tenth century, were frequently elaborately decorated with the parchment colored purple and the text written in gold or silver letters—e.g. the Codex Rossanensis. In the monasteries of the Middle Ages decorated or illuminated manuscripts were manufactured in large numbers. In the tenth century the uncial hand gave way to the cursive or running hand. Codices so written are called minuscules, in distinction from the majuscules or uncials. For other particulars, see BIBLE: BOOK; PALEOGRAPHY; TEXTUAL CRITICISM.

Consult: F. H. A. Scrivener, *Introduction to the Textual Criticism of the New Testament* (London, 1894); Gregory, *Textkritik des neuen Testaments* (Leipzig, 1900); Birt, *Das antike Buchwesen* (Berlin, 1882); Wattenbach, *Paläographie* (Leipzig, 1877-78).

CODIÆ'UM. See CRÖTON.

CODICIL (Lat. *codicillus*, little book or writing, dim. of *codex*, code). A supplement to a will, whereby anything omitted is added, or anything in the body of the will is revoked or explained or changed, as to provide for altered circumstances of the testator or beneficiaries. A codicil is authenticated or executed in the same manner as the will, and is considered a part of the will.

There may be as many codicils to a will as a testator cares to make, and where a provision in a codicil is inconsistent with a provision in a will, the provision in the codicil governs, as the purpose of making the codicil is to express the testator's latest wishes as to the disposition of his property after his death. By the Roman and early English law a codicil was an informal will, made without the appointment of executors, which was considered necessary in a valid will; but the term is no longer used in this sense. See WILL, and the authorities there cited.

CODIFICATION. See CODE.

CODLING. A squirrel-hake (see HAKE), or some other species of the genus *Phycis*.

CODLING MOTH. A small tortricid moth (*Carpocapsa pomonella*), the most serious pest of the apple (q.v.). The females issue from their cocoons in the spring and lay their eggs in

the early evening upon the upper sides of the leaves and occasionally upon the forming fruit. The eggs hatch in about eleven days, and the young larvæ penetrate the fruit usually by way of the calyx. In about twenty days they reach full growth, leave the fruit, crawl to a twig and thence down on the trunk of the tree, where they spin their cocoons and transform to pupæ. The moths issue in two weeks. The moth has a wing expanse of less than three-fourths of an inch. The general color is grayish brown with coppery metallic markings. It lays eggs for a second generation usually upon the fruit, and hibernates in the cocoon. The best remedy consists in spraying with an arsenical mixture such as Paris green or arsenate of lead. Two sprayings in the early part of the season are advised: one a few days after the blossoms have fallen and the other two weeks later. If necessary, subsequent sprayings are made. The banding of the trees with bagging affords the larvæ convenient places for transforming. The bands are examined from time to time and the cocoons destroyed. Consult Simpson, *The Codling Moth*, Bulletin No. 4, new series, Division of Entomology, United States Department of Agriculture (Washington, 1903).

COD-LIVER OIL (*Oleum Morrhue*, or *Oleum Jecoris Aselli*). One of the most valuable therapeutic agents at the disposal of the medical practitioner. It is a pale-yellow fixed oil, obtained from the livers of the cod (*Gadus callarias*) and of other related species of fish that are caught in the northern parts of the Atlantic Ocean. Cod-liver oil is a better food and is more rapidly absorbed than any other oil; its value as a food is due mainly to its being much more readily oxidized than other oils. The benefit derived from it in disease associated with loss of flesh cannot be overestimated. It is given in tuberculosis, in rickets, in tertiary syphilis, in chronic bronchitis, chronic eczema, in many nervous diseases, in general feebleness, etc. It should, however, be administered with some caution, and in moderate quantities, larger doses being liable to cause sickness and diarrhœa. In those cases in which the oil is rejected by the stomach, it may be rubbed into the skin, through which it is readily and certainly absorbed; this treatment is, of course, disagreeable on account of the nauseating smell of the oil. The taste of the oil may be masked to some extent by taking it in coffee or in whisky, or by adding to a dose of the oil a few drops of ether and a drop of oil of peppermint. The taste is completely abolished by taking the oil in soft gelatin capsules now prepared by many manufacturing houses: after remaining in such capsules for some time, the oil turns rather dark, but does not seem to be thereby deteriorated. Cod-liver oil is often taken in the form of emulsions. An emulsion recommended by many medical men contains, besides cod-liver oil, the yolk of an egg, powdered tragacanth, elixir of saccharin, sodium bicarbonate, tincture of benzoin, oil of bitter almonds, chloroform, alcohol, and water. With malt extract, too, cod-liver oil makes an excellent emulsion. The common dose of the pure oil is from a dessert-spoonful to a table-spoonful three times a day.

MANUFACTURE. In preparing the oil for medicinal purposes, only perfectly healthy livers should be used, and the green-colored (or spot-

ted), diseased livers rejected. In former times the oil was obtained as follows. The fishermen would stow away the livers in barrels, which were kept unopened till the end of the fishing season; that is to say, from one to four months. During that time the livers would undergo putrefaction, their hepatic cells, containing the oil, would burst open, and the escaping brownish-yellow oil (called *pale oil*) would rise to the top of the barrels and be drawn off. The livers would then be allowed to undergo further putrefaction, and a quantity of dark-brown oil (called *light-brown oil*) would again be drawn off. Finally, by heating the disintegrated liver-residues thus obtained above the boiling temperature of water, a last quantity of oil (called *brown oil*, though really black) would be obtained. This primitive method, a knowledge of the details of which would render the oil too repulsive to most patients to swallow, is still employed to some extent. By far the greater quantity of the oil, however, now reaching the market is prepared in a much cleaner way by the steam process first introduced by Möller in 1853. Instead of allowing the livers to undergo putrefactive decomposition, Möller obtained the oil by simply heating for about three hours the fresh livers, which were carefully selected, cleaned by washing with water, and separated from the gall-bladders.

To avoid delay, the livers are often heated on board vessels, in wooden apparatus, steam being conducted directly into the mass of livers. Usually, however, the livers are heated in tinned sheet-iron vessels, either single or double walled. The single-walled apparatus is heated over large water-baths; the double-walled by passing steam into the space inclosed between the interior and the exterior walls. In all these apparatuses the temperature is about that of boiling water. An improvement recommended during recent years consists in heating the livers at a considerably lower temperature, for a much shorter time, and as far as possible out of contact with the air: it is asserted that in this manner the oxidation of the oil may be almost completely prevented and that the oil would, therefore, not become rancid, nor acquire the disagreeable property of causing eructations.

COMPOSITION. Besides a large proportion of fats, cod-liver oil has been shown to contain (1) a peculiar principle called *gadin* ($C_{30}H_{46}O_9$); (2) a crystalline substance called *morrhual*; (3) traces of bromine and iodine; (4) biliary principles; and other substances. The brown oils contain also considerable quantities of ptomaines, which cannot but be injurious to health; bleaching brown oil by sunlight only masks the presence of such substances without destroying their injurious properties, and should therefore not be resorted to. It is generally believed that the great benefit derived from cod-liver oil in tuberculosis is due to the specific action of some active principle that must be contained in the oil. It is probable, however, that the effect is due to nothing but the food-value of the fatty constituents of the oil. These fats are commonly assumed to consist, like other natural fats, of the glycerides of oleic, palmitic, and stearic acids. Möller's chemist, P. M. Heyerdahl, states, on the contrary, that cod-liver oil contains a little palmitic, but no oleic or stearic acid; according to him it consists mainly of the glycer-

ides of therapeutic and jecoleic acids ($C_{17}H_{30}O_2$ and $C_{19}H_{36}O_2$, respectively), two unsaturated organic acids which are not known to exist anywhere else in nature, and to which the therapeutic action of cod-liver oil is due. The solid fat that is sometimes removed by freezing the oil is, according to Heyerdahl, also composed mainly of those glycerides; so that its removal appears to serve no purpose whatever. In view of the readiness with which the fats of cod-liver oil undergo oxidation, the oil should be kept out of contact with the air. Cod-liver oil is now prepared in Norway, the United States, Canada, Newfoundland, Great Britain, Iceland, and Russia. By far the greater proportion of the oil reaching the market comes from Lofoten and Romsdal in Norway.

CODOGNO, kô-dô'nyô. A city in the Province of Milan, north Italy, 30 miles east of Pavia (Map: Italy, D 2). It is the principal export market for Parmesan cheese, and has tanneries and linen, silk, and majolica factories. Population (commune), in 1881, 11,444; in 1901, 11,594.

CODRINGTON, Sir EDWARD (1770-1851). A British admiral, born in Gloucestershire. He entered the navy in 1783, and at Trafalgar (October 21, 1805) was captain of the *Orion*. He afterwards served in the Mediterranean and in North America, and rose to the rank of vice-admiral in 1821. In 1826 he was appointed commander-in-chief of the Mediterranean Squadron, and commanded the English, Russian, and French fleets against the Turks at the battle of Navarino (q.v.), immediately after which he was recalled for having exceeded his orders. He was made admiral in 1837. Consult the *Memoir of the Life of Sir Edward Codrington*, edited by his daughter, Lady Bonchier (London, 1873-75).

CODRINGTON, Sir WILLIAM JOHN (1804-84). An English general, son of Sir Edward Codrington. He entered the army in 1821. During the Crimean War he commanded a brigade at the battle of the Alma and at Inkerman, and in 1855 succeeded Sir James Simpson as commander-in-chief in the Crimea. He was elected to Parliament in 1857, was Governor of Gibraltar from 1859 to 1865, and in 1863 was appointed general.

CO'DRUS (Lat., from Gk. Κόδρος, *Kodros*). The reputed last King of Athens. He was the son of Melanthus, and is supposed to have lived about B.C. 1060. He is said to have sacrificed his life for his country when the Dorians once invaded the Attic territory. An oracle having declared that Athens would be saved if its ruler should perish by the hand of the enemy, Codrus, in the disguise of a peasant, entered the Dorian camp and was struck down in a quarrel of his own making. His son Medon was the first Archon chosen for life.

CO'DY, WILLIAM FREDERICK (1845—). An American scout and showman, known as 'Buffalo Bill.' He was born in Scott County, Iowa, and became one of the riders of the Pony Express (q.v.) at its establishment in 1860, and at the beginning of the Civil War was a Government scout and guide. In 1863 he enlisted in the Seventh Kansas Cavalry, and at the close of the war contracted with the Kansas Pacific Railroad to furnish buffalo-meat to its laborers building

the line, in this way earning the name 'Buffalo Bill.' He was again with the army as scout from 1868 to 1872, when he was elected to the Nebraska Legislature. He served in the Fifth Cavalry in the Sioux War of 1876, and in the battle of Indian Creek killed Chief Yellow Hand. In 1883 he organized his 'Wild West Show,' a representation of actual life on the plains, and in 1887 took the 'show' to Europe for the first time.

COEDUCATION (Lat. *co-*, together + *educatio*, education, from *educare*, to bring up, to educate). The association of the sexes in the same classes for instruction is a system that prevails generally in the public elementary schools of the United States and quite extensively in Europe. Except in a few large Eastern cities, as New York and Boston, the free public elementary school in the United States is a mixed school. On the other hand, somewhat less than half the private elementary schools in this country are either for boys, or for girls, exclusively, and in 1899-1900 about 9 per cent. of the pupils receiving elementary instruction were in such schools. The English elementary schools have since 1891 become practically free, and largely coeducational. In France each commune having more than 500 inhabitants must establish a separate elementary school for girls, unless a mixed school is sanctioned by the departmental council. In Prussia the *Volkschulen*, or people's schools, were, according to the law of 1871, advised to separate the sexes wherever possible, except when there were only two teachers in a school. Nevertheless, in 1896 the mixed schools exceeded the others by more than half. In Switzerland the elementary schools are very largely mixed schools: but the course of study and the length of the course in some cantons vary for the sexes, while in Basel the boys' and girls' schools are separate. In Sweden practically all, and in Austria 85 per cent. of the public elementary schools, are coeducational; while in Italy the reverse is true, only about one-fifth of the schools of this grade having such a character.

When, however, we turn to secondary education, we find that in Europe the sexes are almost universally separated. In Prussia the various classes of *Gymnasium* and *Realschulen* are, with the exception of a few girls' gymnasias, for boys exclusively. Elsewhere in Germany, where girls are given public secondary education, as in Bavaria, Saxony, and Baden, their schools are separated. The French public secondary school system consists of State lycées and communal colleges for boys and girls separately. The secondary schools of Switzerland and for the most part those of Sweden keep the sexes apart. England has no public secondary schools for girls. The private secondary schools are, to a slight extent, coeducational when they are predominantly day schools or contain younger children. In the United States the contrast is striking. In 1899 there were 5495 public high schools, of which 5439 were coeducational, 22 for girls only, and 34 for boys. Of 1957 private secondary schools, 1092 were coeducational, 541 for girls, and 324 for boys, exclusively. The public normal schools in 1898-99 numbered 166. Of these, two were distinctly for women; twelve had no men in attendance, though presumably coeducational; the rest contained both sexes. Of the 165

private normal schools five prepare kindergarten teachers and have no men in attendance, one is distinctly for women, while two others have no men, and three no women in attendance. The rest have a mixed attendance. The English training-schools for teachers, the French primary and superior normal schools, and the Prussian normal schools separate the sexes.

An examination of the facts stated above will show that so far as Europe is concerned they bear out the general theory current there, that the sexes should be separated as far as possible in education. Wherever separate schools can be maintained, the French and Prussian systems require them, and they are plainly favored by the English. Since, however, elementary instruction has come to be regarded as necessary for both sexes, wherever financial considerations prevent separate schools, the elementary school is mixed. And it is this financial consideration that has most largely been the occasion of mixed schools in the United States. Through the efforts of Horace Mann, a system of town coeducational high schools was in 1826 initiated in Massachusetts, and from that time on such schools spread, at first slowly, then rapidly, throughout the Republic, until to-day they are almost within reach of all. The victory of public secondary education was in general the victory of coeducation.

The Civil War placed both elementary and secondary education largely in the hands of women teachers. There accordingly followed a demand on their part for better opportunities for instruction. Oberlin Collegiate Institute in Ohio had, in 1833, admitted women. In 1855 Antioch College, also in Ohio, was founded—coeducational from the beginning, and having as its first president Horace Mann, the ardent advocate of this system. The following State universities were from the beginning coeducational: Utah, opened in 1850; Iowa, opened in 1856; Washington, opened in 1862; Kansas, opened in 1866; Minnesota, opened in 1868; and Nebraska, opened in 1871. The State universities of Indiana and Michigan admitted women in 1868 and 1870 respectively. To-day, of the thirty-two State universities, all except those of Virginia, Georgia, and Louisiana are coeducational. Of private colleges, Cornell, after an investigation and stimulated by a generous offer from Henry W. Sage, admitted women in 1872. Other private institutions were, however, somewhat slow to follow. Boston University, founded in 1873, admitted women from the first, and in 1883 the Massachusetts Institute of Technology became coeducational. To-day, of fifty-eight leading colleges and universities, four are independent colleges for women, three are women's colleges affiliated with colleges for men, thirty are coeducational, and of the remaining twenty-one, five have affiliated women's colleges. In addition, all the great university foundations, except Harvard and Princeton, admit women to graduate instruction. Only twelve of the fifty-eight institutions admit women to none of their departments; and these are, with one or two exceptions, on the Atlantic seaboard. Women are also rapidly gaining ground in the professional colleges. In 1899 eighty out of 149 colleges of medicine, sixty-four out of eighty-six colleges of law, forty-four out of fifty-six colleges of dentistry, and forty-eight out of fifty-two col-

leges of pharmacy in the United States were coeducational.

In Canada, McGill University was opened to women in 1883. To-day all the Canadian universities, six in number, admit women. The leading universities of Australia admit women not only as students, but as lecturers and professors. In 1878 the University of London opened all degrees, honors, and prizes to students of both sexes on equal terms. Victoria University and the University of Wales give similar privileges to women. The University of Durham excludes women from only the degree in theology. Cambridge admits women to nearly all university and college lectures and grants a titular degree to such as fulfill the regular conditions. This degree, however, does not admit them to the governing board of the university. At Oxford women are admitted to nearly all university and college lectures, except those in medicine. They may take the examinations, and the results are announced, but they do not receive a degree. The four universities of Scotland, Aberdeen, Saint Andrews, Edinburgh, and Glasgow admit women to all degrees except in law, and Aberdeen even to that. The Royal University of Ireland grants equal privileges to both sexes. In France women are admitted to lectures on the same terms with men, professors, however, having a discretionary power of exclusion.

In Germany the struggle of women for admission to the universities has been especially stubborn, and resistance has now to a very considerable extent given way. To be admitted, a woman must obtain consent from the Minister of Instruction, the rector of the university, and the professors whose courses she wishes to attend. Ordinarily only the courses of the philosophical faculty are thrown open to them, but in a few cases women have attended courses in medicine and law. Heidelberg, Freiburg, and Göttingen were among the first to grant the degree of Ph.D. to women; but in 1898 Berlin, perhaps the most conservative of all in this respect, bestowed this degree on Fräulein Neumann. In 1898-99, 315 women, mostly foreigners, attended the German universities. In Austria, since 1878, women have been admitted to the eight universities as hearers, and recently, in the case of foreigners, as matriculated students. During the winter of 1899-1900 forty women were registered at Vienna, and in 1897 the degree of M.D. was granted to Fräulein Possauer. In 1895 the three Hungarian universities were thrown open to women, and graduates of the medical departments are allowed to practice. The Italian universities have, since 1876, all been open to women on the same terms with men, and the female attendance is large. The medical faculties of the Swedish universities were opened to women in 1870, and those of law and philosophy in 1873. In 1899 six women had taken the degree of Licentiate in Philosophy, and one that of Doctor of Laws. The latter, Fräulein Eschelsson, was made privat-docent (q.v.), to lecture on civil law. In Switzerland the universities are all open to women, and in most cases on the same terms as to men. At Zurich women were formally admitted in 1872, and they are even permitted to hold professorial chairs. There were, in 1895, 200 women in attendance, and a woman was lecturer on Roman law. Women have been admitted on the same terms as men to the Uni-

versity of Copenhagen since 1875. The Spanish universities and those of the Netherlands are equally open to both sexes. Russian higher education for women has had a stormy history. The medical schools were opened to them about 1860, then closed, and again in 1872 reopened on account of the Nihilism that sprang up among women who went abroad, and particularly to Switzerland, to study. A separate medical school for women was established at Saint Petersburg in 1872, suppressed in 1882 on account of Nihilism, and in 1897 reopened. The universities are now closed to women, but there are higher courses given to them at Saint Petersburg under the Minister of Public Instruction.

Investigations made by the University of Wisconsin, and in 1893-94 by the University of Virginia, have shown that in coeducational institutions, according to testimony gathered in the United States and England, women equal or even surpass men in excellence of scholarship. Up to 1898 54 per cent. of the women taking examinations for matriculation at the University of London had passed, as against 53 per cent. of men for the same period. Nor has the percentage of withdrawals from college on account of health been greater with women than with men. Investigations into the health, etc., of college women are given under COLLEGIATE EDUCATION FOR WOMEN. In the West, where coeducation is practically universal, no evil consequences have sprung from it, and there is but slight demand for separate schools. The main objection of both male and female students to coeducation is that it implies more restraint than exists where the sexes are apart. Of the many arguments for coeducation, doubtless that of economy has been most effective. It is noteworthy that in a report of the Massachusetts Society for the University Education of Women the fact that the University of California had a preponderance of women students was taken as a sign of the need for a separate college. Indeed, it may be said that having won, in most cases, their contention for admission to institutions for men, the advocates of higher education for women are turning their attention more and more toward separate schools, and that the privilege of separate education is, particularly in the East, coming to be sought and preferred by women rather than by men. Consult: Clarke, *Sex in Education* (Boston, 1873); Fairchild, "Coeducation of the Sexes," in *Report of United States Commissioner of Education* (Washington, 1898), and *Circular of Information*, No. 2 (1883), on coeducation in the public schools; A. Sohman Smith, "Coeducation of the Sexes in the United States," with bibliography, in *Report of United States Commissioner of Education* (Washington, 1891-92); "Coeducation," in *Report of United States Commissioner of Education* (Washington, 1894-95).

COEFFICIENT (Lat. *co*, together + *efficere*, to work out, produce). In algebra, any factor of an expression is called the coefficient of the rest of the product. The word, however, is usually applied only to some factor whose numerical value is expressed or known, and which appears first in the product—e.g. in the expression $3ax$, 3 is the coefficient of ax , and $3a$ is the coefficient of x . Vieta seems to have introduced the use of the word in this sense (1591). Since $a = 1 \cdot a$, the coefficient 1 may be understood be-

fore any letter. The coefficients in any algebraic equation of the form

$$x^n + a_1x^{n-1} + a_2x^{n-2} + \dots + a_n = 0$$

are related to the roots; thus,

$$r_1 + r_2 + \dots + r_n \equiv \Sigma r_1 = -a_1, r_1r_2 + r_1r_3 + \dots + r_{n-1}r_n \equiv \Sigma r_1r_2 = -a_2, \dots, r_1r_2 \dots r_n = \pm a_n$$

See EQUATION; for differential coefficients, see CALCULUS; and for binomial coefficients, BINOMIAL THEOREM.

DETACHED COEFFICIENTS. In many operations with algebraic functions, in which the letters are involved in ascending or descending powers, the required calculation may be performed with coefficients only—e.g. to multiply

$$x^3 + 3x^2y + 3xy^2 + y^3 \text{ by } x^2 + 2xy + y^2$$

$$\begin{array}{r} 1 \quad | \quad 1 + 3 + 3 + 1 \\ 2 \quad | \quad 2 + 6 + 6 + 2 \\ 1 \quad | \quad 1 + 3 + 3 + 1 \\ \hline 1 + 5 + 10 + 10 + 5 + 1 \end{array}$$

Hence $x^5 + 5x^4y + 10x^3y^2 + 10x^2y^3 + 5xy^4 + y^5$ is the product.

INDETERMINATE COEFFICIENTS. Many functions may be expanded to any desired number of terms by assuming arbitrary coefficients whose values are determined from resulting equations

—e.g. to expand $\frac{1}{1-x}$ to 4 terms, assume

$$\frac{1}{1-x} = a + bx + cx^2 + dx^3 + c \dots$$

Then,

$$1 = a + (b-a)x + (c-b)x^2 + (d-c)x^3 + \dots$$

If $a = 1$, then

$$b - a = 0, c - b = 0, d - c = 0 \dots$$

That is to say, if $a = 1$, $b = a = 1$, $c = b = 1$, $d = c = 1$, etc. Substituting these values in our assumed equation, we find:

$$\frac{1}{1-x} = 1 + x + x^2 + x^3 + \dots$$

The method is old as literal algebra.

In physics, a constant expressing the measure of some property of a substance is often called a coefficient—e.g. the *coefficient of elasticity* is the quotient of the stress by the strain, or the quotient of the applied pressure by the voluminal compression produced. The *coefficient of simple rigidity* is the ratio of the shearing stress to the shearing strain. The *coefficient of refraction* (often called the index of refraction) is equal to the ratio of the speed of light in the first medium to its speed in the second. This ratio for air and water has the value 1.336, representing the refractive power of water. The *coefficient of friction* is the quotient of the resistance due to the sliding of one substance on another and the pressure producing the contact. The *coefficient of expansion* is the amount of expansion of a body of unit magnitude due to an increase of 1° in temperature.

COEFFICIENT OF EXPANSION. See HEAT.

COEFFICIENT OF EXPANSION FOR GASES. See GASES, GENERAL PROPERTIES OF.

COEFFICIENT OF FRICTION. See FRICTION.

COEFFICIENT OF SELF-INDUCTION, and **COEFFICIENT OF MUTUAL INDUCTION.** See ELECTRICITY, and INDUCTION.

COEHOORN, kō'hörn. A small mortar, usually made of bronze, and formerly used in boats and small vessels and on the gangways of larger

ships. It threw a shell of 12 to 14 pounds weight. Its name is derived from that of its inventor, Coehoorn (q.v.). For illustration, see ARTILLERY.

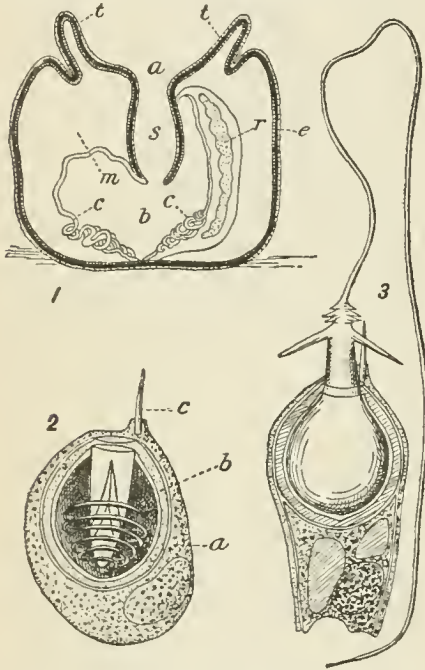
COEHOORN, kō'hörn, **COEHORN,** or **CO'HORN,** MENNO VAN (1641-1704). A Dutch military engineer. He was born near Leeuwarden, and after studying at the University of Franeker, entered the Dutch service at the early age of sixteen, as captain in an infantry regiment. He distinguished himself at Maestricht, Graave, and Senefle, in 1673-74. It was at the siege of Graave that he used with effect a mortar of his own design, later called after him. After the peace of Nimeguen (1679) he was employed to fortify the various Dutch strongholds. In 1685 he published his important work on fortification, *Nieuwe vestingbouw*, which was speedily translated into French and German. Coehoorn was actively employed during the wars of William of Orange against French aggression, and at Kaiserswerth, Bonn, Fleurus, and Namur he showed himself no mean opponent of the great Vauban. He was made a lieutenant-general in 1695, and after the Peace of Ryswick (1697) was employed to refortify several of the Dutch towns. When the War of the Spanish Succession began, Coehoorn was at once dispatched to the front, and, by his brilliant and energetic generalship, reduced six of the chief French strongholds. In 1704, while hastening to confer with Marlborough at The Hague, he was stricken down by apoplexy, March 17th. Consult: De Peyster, *Life of Coehoorn* (New York, 1860); Bonomer, *Essai général de fortification* (Paris, 1814).

CŒLEBS (sē'lēbz) **IN SEARCH OF A WIFE.** A novel by Hannah Moore (1809), giving a bachelor's idea of a model wife.

CŒLEENTERATA, sē-lēn'tē-rā'tā (Neo-Lat. nom. pl., from *caeleteron*, from Gk. *κοῖλος*, *koilos*, hollow + *έντερον*, *enteron*, intestine). One of the phyla of the animal kingdom, usually ranked as next to the lowest of the types of Metazoa; the polyps and jelly-fishes. It is characterized by the absence of a body-cavity and a separate circulatory system, both of these being functionally replaced by the system of chambers or tubes into which the mouth opens. Owing to the fact that this system is not only digestive, but that it takes the place of the body-cavity, it is sometimes called the *caeleteron*. More commonly the *caeleteron* is called the gastro-vascular cavity, since it not only serves as a stomach for digestion, but, by means of its branches, as a vascular or circulatory system in conveying food (and perhaps oxygen) to all parts of the body. All of the *Cœlenterata* are more or less perfectly radially symmetrical, and generally on the number 4 or 6; that is, they can be divided in either four or six vertical planes, and the resulting halves will be approximately similar. The *Cœlenterata* may therefore be defined as radially symmetrical, unsegmented Metazoa, having a gastro-vascular cavity. In most *Cœlenterata* there is no anus, waste matter from the digestive system being ejected through the mouth. Between the endodermal lining of the gastro-vascular canals and the ectodermal covering of the body is a structureless layer, known as the supporting layer or 'mesoglaea.' This may be very thin and firm, or it may be very thick and gelatinous. It

contains scattered nerve and muscle cells, skeletal cells, and pigment-cells.

The mouth is usually surrounded with a circle of tentacles, which function both as organs of touch and as capturing organs. The number of these oral tentacles varies from two to several hundred, and their size and shape vary quite as much. On these tentacles, and often on other parts of the body, there are batteries of remarkable stinging cells. (See NEMATOCYST.) These are wanting in only one class, the Ctenophores (q.v.). The sense-organs of the Cœlenterata are very simple, as a rule, and many forms have no other sense than that of touch. Pigment eyes and positional organs of several kinds occur in the free-swimming forms.



FEATURES OF CŒLENTERATA.

1. General anatomy: *a*, mouth; *s*, gullet; *b*, cavity of the body (enteron); *e*, integument, composed of ectoderm and endoderm, separated by a space; *c c*, convoluted cords (craspeda) containing thread-cells (see 2), and forming the free edges of the mesentery (*m*); *t t*, tentacles; *r*, reproductive organ contained within the mesentery. 2. Thread-cell or stinging-cell (nematocyst) of a hydra, undischarged; *a*, formative matrix (cnidoblast); *b*, coiled thread within the cell; *c*, trigger hair (cnidocil). 3. The same everted and discharged by rupture of the cell following a touch upon the cnidocil.

The sexes are separate, and the eggs are set free and fertilized in the water. In their life history the Cœlenterata show some of the most interesting phenomena in the whole animal kingdom. To understand them we must remember that these animals not only reproduce by means of eggs, but even more frequently, like plants, by budding, and that oftentimes, as in plants, the buds do not become detached, but remain connected with the parent stock as long as they live. Moreover, in the type of Cœlenterata we have two very different sorts of individuals—those which are bell-shaped and free-swimming, known as medusæ (q.v.), and those which are more or less cylindrical, and are attached to

some object, known as polyps (q.v.). Now, it so happens that the polyp form of a species may give rise to a medusa by budding, and that medusa breaks away and becomes free-swimming; it gives rise to eggs which in turn develop into attached polyps. This process is simple *alternation of generations* (q.v.)—that is, each generation is like its grandparents, and not like its parents. The process may become simplified, until the medusa generation is entirely lost, by the medusa bud never getting free from the polyp and ultimately losing even the appearance of a medusa. Or the process may become very much complicated by additional generations produced by budding coming in between the others. The forms which produce the eggs are of course the *sexual* generations, while those that produce the buds are the *asexual*.

The interesting and important question as to whether the first Cœlenterata were medusoid or polypoid forms has been vigorously debated, but is by no means fully determined yet. Owing to the fact that the buds so often remain intimately connected with the parent, we find more or less complicated colonies or stocks very common. These may be free-swimming, as in the siphonophores (q.v.), having then arisen from medusæ; or they may be fixed as in all corals (q.v.), and in such cases have arisen from polyps. In most such colonies, owing to the division of labor that has taken place, we have differently appearing individuals in one colony, some being adapted to locomotion, some to capturing prey, some to digesting food, some for defensive purposes, and some simply for reproduction.

The Cœlenterata are a large group, of many hundred species, widely distributed in the oceans of all parts of the world. Only three or four species are known as occurring in fresh water. As individuals most of the species are small, though a few sea-anemones and some medusæ reach a diameter of over a foot; in colonies, however, some of the reef-building corals cover an extraordinary area. As for color, the Cœlenterata are among the most gorgeous of animals; no shades are too exquisite or delicate. Nearly all are carnivorous, though perhaps some forms may use vegetable matter in part. The only species of any direct use to man are the precious and the lime-producing corals.

In classification the Cœlenterata present difficulties. The ctenophores are so different in some important ways from other cœlenterates, that some zoologists prefer to regard them as a separate type, especially since two genera are known that connect them directly with the flatworms (Platoda); but as they are radially symmetrical and have a gastro-vascular system, they really come within the definition of cœlenterates. The type then may be divided into three great classes: (1) *Hydrozoa* (q.v.), which have no gastral filaments and have an endodermal œsophagus, if any; (2) *Scyphozoa* (q.v.), which have endodermal gastral filaments and give rise to medusæ; (3) *Actinozoa*, or *Anthozoa* (q.v.), which are polyp-form, possess mesenteries, and never give rise to medusæ; and (4) *Ctenophora* (q.v.), distinguished by having eight meridional rows of swimming-plates.

Fossil Forms. The Cœlenterata comprise some of the oldest fossils found in the Lower Cambrian rocks (*Archæocyathus* and *Ethmophyl-*

lum); they increase rapidly in variety, and attained already, early in the Silurian, great importance as rock-builders in the reef-building corals (see CORAL ISLAND; LIMESTONE; DOLOMITE), which persisted through all formations to the present time, their remains often forming the greater part of whole mountain ranges, as in the Southern Alps. Medusoid impressions, representing not only the Hydromedusæ, but also the Scyphomedusæ, occur as early as the Cambrian in Bohemia, Sweden, and North America, and are known from later rocks. (See MEDUSA; JELLY-FISH.) Those suborders of the Hydromedusæ, whose species possess either chitinous-calcareous or calcareous skeletons—viz. the Hydrocorallinæ and Tubulariæ—are also found in the condition, though only sparingly and not until the Mesozoic and Tertiary formations. The most important representatives of the first suborder are the calcareous skeletons of Millepora, appearing in the Eocene, and of the second sub-order, the masses of calcareous concentric lamellæ with supporting pillars, which have been described as Ellipsactinia from the Alpine Jurassic, and as Parkeria and Porosphara from the Cretaceous. Similar calcareous concentric lamellose forms, but without larger apertures on the surface, the Stromatoporoidea (see STROMATOPORA), are extremely common in the Silurian and Devonian systems, where they were reef-builders and important rock-making organisms, being associated with the corals. Their real systematic position being unknown, they are provisionally allied with the Hydromedusæ.

A like relation to the Hydromedusæ is held by the graptolites (see GRAPTOLITA), which, forming chitinous hydroid-like colonies, swarmed, either as holoplanktonic or pseudoplanktonic organisms, in the Silurian seas. They differ in some important features, as the possession of a sicula and virgula, from the hydroids. On account of the world-wide distribution of their species and their short range, they are most important horizon-markers or index fossils.

For bibliography of fossil forms, see the articles on CORAL; GRAPTOLITA; MEDUSÆ; STROMATOPORA; JELLY-FISH; etc.

See also ACALEPHÆ; ALCYONARIA; SEA-ANEMONES; ANTHOZOA; HYDROIDS; POLYPS; PORTUGUESE MAN-OF-WAR; SEA-FANS; SEA-PEN; SIPHONOPHORA; ZOÖPHYTES. Consult: Agassiz, L. *Contributions to the Natural History of the United States*, vols. iii. and iv. (Boston, 1862); Agassiz, A. *Monograph of North American Acalephæ*, and other papers in the *Memoirs of the Museum of Comparative Zoölogy*; and Fewkes, "Aid to Collectors of Cœlenterata," etc., *Bulletin of Essex Institute*, vol. xxiii. (Salem, 1893).

CŒLE-SYRIA, sē'lē-sī'ŕī-ā (Lat., from Gk. Κοιλὴ Συρία, Koilē Syriā, hollow Syria). A geographical term used by Greek writers in three different senses: (1) Originally, in the first century of the Seleucid era, Cœle-Syria was the name given to the region lying between the Lebanon and Anti-Lebanon mountains in Syria (cf. I. Esdras iv. 48). 'The Valley of Lebanon' denotes the same district. (2) Later, in the second century B.C., it was used to designate all the Syrian regions in the southwest—i.e. East and West Palestine, the Lebanon region, and other adjacent lands except Phœnicia. Such is its significance in most instances in I. Esdras

and in the First and Second Maccabees. (3) In Roman times Cœle-Syria did not include West Palestine, certainly not Samaria and Judea, and probably not Galilee. It then signified that portion of Syria of which Damascus was the metropolis—i.e. the Lebanon countries, the territory about Damascus, and East-Jordan Palestine. Some ancient writers, as Polybius and Josephus, at times use the term in a loose way, as including all southern Syria as far as the Egyptian border.

COELHO, kô-ã'lyô (Port., rabbit), or CONEJOS. The rabbit-fish (*Promethichthys Prometheus*) of the Middle Atlantic, so called in Madeira. See RABBIT-FISH.

COELHO, GONÇALO. A Portuguese navigator, the commander of a ship on the coast of Senegambia about 1488. He is supposed to have been the leader of the expedition of 1501 to explore the Brazilian coast. Afterwards he was placed in command of six ships sent out from Lisbon in 1503 to seek a passage to the East Indies around the southern part of Brazil, the extent of South America being at that time unknown. After suffering shipwreck and becoming separated from a part of his fleet, Coelho continued his journey of exploration in the remaining ships beyond the present site of Rio de Janeiro, returning to Lisbon in 1506.

COELHO DE ALBUQUERQUE, dâ ãl'bôô-kêr'kâ, DUARTE (1537-c.79). A Portuguese governor. He was born at Olinda, Pernambuco, and was the oldest son of Duarte Coelho Pereira, whom he succeeded as Captain-General of Pernambuco in 1554, which possession, after completing his education in Europe, he governed personally from 1560 to 1572. On his return to Portugal he accompanied Dom Sebastião to Africa, was captured by the Moors, August 4, 1578, and died in captivity at Fez.

CŒLICA (Lat. nom. pl., celestial, from *cælum*, heaven). A collection of short poems by Fulke Greville (1633).

CŒLIC'OLÆ (Lat., worshipers of heaven). A sect condemned in decrees issued by Theodosius II. in 408 (*Cod. Theodos.* 16, 5, 43) and in 409 (*Cod. Theodos.* 16, 8, 19) as marked by a "new and unwonted audacity," and, as heretical, ordered to conform within a year or take the consequences. Augustine alludes to it in a letter (*Ep.* xlv., cap. vi., § 13) written in 398. Consequently the sect was extant in the fourth and the fifth centuries. It seemingly did not last much longer. Its exact nature is difficult to determine, but probably it presented a combination of Jewish and Christian doctrines and practices, among which the most prominent was the use of baptism along with circumcision.

COELLO, kô-ã'lyô. ALONZO SANCHEZ (c.1515-90). A Spanish painter of Portuguese descent, born near Valencia. His first work was done probably under some minor Flemish master in Madrid. Afterwards he went to Lisbon with Antonio Moro, and worked there until he succeeded that artist as Court painter to Philip II. of Spain. He became a great favorite with Philip, and executed many portraits of the King, his children, and the personages of the Court. Among his best works are portraits of Don Carlos and the Infanta Isabella in the Prado; of two unknown ladies, life-size, in the Museum of Vienna, and that of

Alexander Farnese in the Hermitage at Saint Petersburg. In the Escorial there are some far less interesting pictures of saints by him, and there is a "Martyrdom of Saint Sebastian" in the Prado, which is one of his best subject pictures.

COELLO, CLAUDIO (1621-93). A Spanish painter, born in Madrid. He studied under Francesco Rizi, and afterwards under Carreño de Mirado, who was a pupil of Velazquez. Coello was in Rome for some time and returned to Spain in company with the painter José Donoso. Together the artists painted many large pictures for churches, and decorations in fresco for various palaces. All of these works have disappeared. Their designs for the triumphal arches raised to celebrate the marriage of Charles II. with Marie Louise d'Orléans brought Coello to the notice of the King, and a few years later he became Court painter. At this time he painted his greatest picture, "Charles on His Knees Among the Nobles of His Court." In this there are more than fifty portraits. Coello was now the foremost painter of his time, but the rise of Luca Giordano discouraged him and he lost his prestige. Coello's mature style was based on that of Rubens and Titian, and his best work is of extraordinary power. His finest pictures are in the galleries at Toledo, Salamanca, and Madrid. Two of his large religious compositions are at the Prado. In the Hermitage at Saint Petersburg there is a portrait of Coello by himself.

CŒLORYNCHUS, *selô-rin'kûs* (Neo-Lat., from Gk. *κοίλος, koilos*, hollow + *ῥύγχος, rhyngchos*, nose). A genus of small deep-sea fishes of the family Macruridae (q.v.), allied to the cods, which inhabit the deeper parts of various oceans and seas. There are many species, of which a common one is the silvery gray *carminatus* of the West Indian region. See PLATE OF CODFISH AND ALLIES.

COEN, KŌEN, JAN PIETERSZON (1587-29). The founder of the Dutch colonial power in the East Indies. He entered the service of the East India Company in 1607, and was Governor-General in 1618-23 and again in 1627-29. During his first term he fought successfully against the English and the native princes, and in 1619 destroyed the town of Jacatra, on the site of which he soon afterwards founded Batavia. He succeeded in compelling the English to withdraw nearly all their factories from the archipelago and in shutting them out from the trade of the islands.

CŒNOBIA (Neo-Lat. nom. pl. of *caenobium*, Gk. *κοινόνιον, koionobion*, life in a community, from *κοινός, koinos*, common + *βίος, bios*, life). A term applied to certain colonies of cells among the algae, remarkable for their regularity of form. They are developed inside mother cells whose contents divide into the required number of daughter cells, which group themselves in the interior. In some forms (*Volvocales*) the individual cells are ciliated, so that the entire colony swims through the water. The colony of *Volvox* may have as many as 22,000 cells. Other colonies are motionless, and contain a small number of cells arranged with beautiful symmetry (*Pediastrum*, *Scenedesmus*, etc.). The water-net (*Hydrodictyon*) is an immense *caenobium* of 700 to 20,000 cells.

CŒNOCYTE (Gk. *κοινός, koinos*, common + *κύτος, kytos*, cavity). The body of an unpartitioned plant, and also a segment of the body of an incompletely partitioned plant, found chiefly among certain algae and fungi. It differs from a single cell, which has one nucleus, in that the contained protoplasm contains many nuclei. The protoplasm lies in a continuous cavity where portions of it containing the nuclei and other structures slowly circulate. Excellent illustrations are presented by the molds among the fungi, and by the order Siphonales among the algae. For details, see ALGÆ; FUNGI.

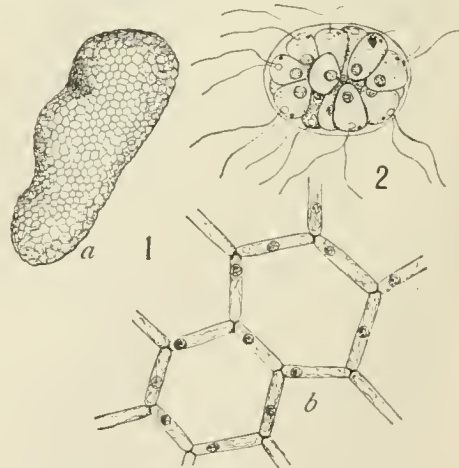
COERCION (from Lat. *coercio*, from *coercere*, to restrain, from *co*, together + *arcere*, to confine). In law, such a degree of physical force, or threatened personal violence, or intimidation, applied to a person as constrains or induces him to do some act which, but for such constraint, he would not have done.

Under some circumstances coercion applied to a person's wife, husband, or near relative, or injury to his property, will be held to have the same effect as if it were applied to the person himself.

The consequences of an act done under coercion may generally be avoided by a person, as it is not the product of his will and he is not considered responsible for it. In the United States, generally, where a person commits a crime under such coercion that he has a reasonable apprehension of instant death or serious bodily harm he is excused from the consequences. A less degree of coercion will render a civil act voidable. See DURESS.

COERCION ACTS. See IRELAND, *History*.

CŒUR, KĒR, JACQUES (c.1395-1456). A celebrated French merchant and financier, born at Bourges. As early as 1433 he began to trade with the Levant. In 1436 Charles VII. made him master of the mint in Paris, and in 1441 he was ennobled. Three years later he was sent as one of the royal commissioners to preside over the new Parliament of Languedoc, and in 1448 he represented the French King at the Court of Pope Nicholas V., who treated him with great



CŒNOBIUM.

1a, water-net (*Hydrodictyon*); 1b, the same with two meshes enlarged; 2, *Pandorina*.

distinction and granted him a special license to traffic with the infidels. The power and fame of Cœur were now at their highest. He had represented France in three embassies, and had furnished much of the money for the war which had driven the English from Normandy. He was invested with various offices of dignity, and possessed the largest fortune that had ever been amassed by a private French citizen. The sea was covered with his ships and he carried on trade with England, Flanders, Spain, Italy, Turkey, Asia, and Africa. His fall, however, was sudden. In February, 1450, Agnes Sorel, the King's mistress, died; and Cœur, who was one of her executors, was accused of having poisoned her. There was no reasonable ground for such a charge; nevertheless the needy and unscrupulous King, in July, 1451, ordered his arrest and the seizure of his goods, reserving for himself a large sum to carry on the war in Guicenne. Cœur was tried and convicted by men whose business it was to convict him without regard to the evidence or to justice, and he was condemned to pay to the King an enormous sum and to remain a prisoner until the judgment was fully satisfied. All his property was confiscated, and he was subject to exile during the royal pleasure. In 1454 he managed to escape, and, though pursued, succeeded in reaching Rome, where he was well received by the Pope. He died at Chios. Consult Clément, *J. Cœur et Charles VII.* (Paris, 1886).

CŒUR D'ALÈNE, kēr dā-lōn' (Fr., awl-heart: the French translation of the Indian tribal name Skitswish). A lake in Kootenai County, Idaho (Map: Idaho, A 2). It lies in a wild region surrounded by the mountains of the same name. It is about 30 miles long and from two to four miles wide. Its waters are cool and clear and afford excellent fishing. It receives the Saint Joseph River from the east at its southern end, and has for its outlet the Spokane River, which flows west from its northern end.

CŒUR D'ALÈNE. A Salishan tribe formerly holding the territory about the lake and river of the same name in northern Idaho, and now settled upon a reservation in the same country. The name, signifying 'awl-heart,' is said to have been originally given to a chief of the tribe in derision of his stinginess. The natives call themselves Skitswish, the Skeetsomish of Lewis and Clark. They now number 450.

CŒUR DE LION, de l'ōn' (Fr., Lion-hearted). A title given to Richard I. King of England, for his exploits, mainly in the Crusades.

COFFEE (Turk., Ar. *qahwa*, the coffee beverage). A beverage made of the roasted seeds of the coffee-tree, *Coffea Arabica*, a native of Abyssinia and Arabia, now naturalized in many tropical countries. The genus *Coffea* comprises a number of species, but the *Coffea Arabica* is the species widest known which possesses valuable properties: the seeds of *Coffea Mauritiana*, prepared in the same way, are bitter and slightly emetic. In the wild state *Coffea Arabica* is a slender tree 15 to 25 feet high, with few branches; in cultivation it is seldom allowed to become more than 6 to 10 feet high, and is made to assume a sort of pyramidal form, with horizontal branches almost from the ground. The leaves are evergreen and leathery; the flowers are small, fragrant, and snow-white; and the whole appear-

ance of the tree is very pleasing. The fruit, when ripe, is of a dark-scarlet color, and the seeds are horn-like and hard. The seeds are commonly termed coffee-beans, a name derived not from any resemblance of the seeds to beans, but from the Arabic word *bunn*, which means 'coffee.' The seeds are also sometimes, but very incorrectly, designated coffee-berries. For illustration, see BEVERAGE PLANTS.

The earlier history of the coffee-tree is not very clear. It was not known to the Greeks or Romans, but in Arabia it was certainly in use in the fifteenth century. Toward the end of the seventeenth century, plants were carried from Mocha to Batavia by Wieser, a burgomaster of Amsterdam, and from the botanical gardens at Amsterdam the Paris Garden obtained a tree. A layer of this was carried out to Martinique in 1720, where it succeeded so well that in a few years all the West Indies could be supplied with young trees. The following sorts are particularly distinguished from one another in commerce: *Mocha coffee*, which comes from Arabia, and is known by its small gray beans inclining to greenish; *Jara* or *East Indian coffee*, which has large yellow beans; *Jamaica coffee*, with beans somewhat smaller and greenish; *Surinam coffee*, which has the largest beans; *Bourbon coffee*, with beans pale yellow and almost whitish. The coffee-tree succeeds where the temperature of the year ranges from 60° to 90° F. It does best in a sandy or gravelly soil, well drained, and on high lands or hill ranges from 1000 to 3000 feet above the sea. In Peru and Ecuador it is acclimatized at an elevation of 6000 feet, where, however, frost never occurs. The fruit ripens in hot-houses. Coffee plantations are laid out pretty much in the same way everywhere. One-year-old trees 12 to 16 inches high are set from the nursery. They need shade at first and in a hot dry climate should be shaded at all times. They are pruned to the same height, and the ground between them is carefully kept clear of weeds. Where the climate is dry, abundant irrigation is necessary, but the supply of water is cut off as the fruit begins to ripen, in order to improve its quality. The tree yields its first crop in the third year, and the crop from a full-grown tree may amount to two pounds of coffee-beans. The life of a tree is about forty years. As the coffee-tree continues flowering for eight months, its fruits are of very unequal ripeness: in the West Indies and Brazil three gatherings are made annually. The beans are placed on mats or large floors specially adapted for the purpose, where they are dried by the sun's rays, being meanwhile frequently turned. They are passed between rollers to remove the dried pulp of the bean, and the membrane which incloses the seeds themselves, and the coffee is afterwards freed from impurities by winnowing, and conveyed in bags to the seaports. As equal care is not, however, bestowed upon the preparation of it in all places where it is cultivated, there are great differences in quality and price. The use of coffee as a beverage was introduced from Arabia, in the sixteenth century, into Egypt and Constantinople. Leonhard Rauwolf, a German physician, was probably the first to make coffee known in Europe, by the account of his travels printed in 1573. Soon after the first introduction of

coffee, coffee-houses arose almost everywhere. The first in Europe was established at Constantinople in 1551. In London the first coffee-house was opened in Newman's Court, Cornhill, in 1652, by a Greek named Pasqua. This Greek was the servant of an English merchant named Edwards, who brought some coffee with him from Smyrna, and whose house, when the fact became known, was so thronged with friends and visitors to taste the new beverage, that to relieve himself from annoyance, Edwards established his servant in a coffee-house. The first coffee-house in France was opened at Marseilles in 1671, and in 1672 there was one opened in Paris, which soon had several competitors. In the East coffee is not usually prepared as a beverage in the same way as in Europe, except by Europeans. A decoction of the unroasted seeds is there generally drunk; and for the 'Sultan's coffee,' the pericarp, with the dried pulp roasted, is employed.

The great demand for coffee has led to the employment of a number of cheaper substitutes, of which chicory (q.v.) root is the best known. Of others, dandelion root, carrot, the seeds of the common yellow iris, cereals, and sweet potatoes may be mentioned. They are prepared by roasting like coffee. The seeds of *Astragalus beticus* are known on the Continent of Europe as Swedish coffee, and are said to be the best substitutes for coffee yet discovered. But all the substitutes lack the most important constituent of true coffee, viz., caffeine (q.v.), and are therefore very different from it in their qualities. Coffee is subject to great adulteration, most of the articles specified as substitutes being employed for this purpose. The chief substance of mixture is chicory, the use of which is not injurious, however. The chief effect of adding chicory is to deepen the color. A variety of coffee known as *Liberian coffee*, a native of Western Africa, is being introduced into some countries, particularly in Ceylon. It is a much coarser variety, but thus far it has withstood the ravages of the leaf disease that had nearly destroyed the coffee plantations of that country. The leaves of the coffee-trees are used in the western part of Sumatra instead of the seeds. They are prepared by quick drying in a manner similar to that in which tea-leaves are prepared; and in this state contain even a larger proportion of caffeine than the coffee-beans of our shops. It seems not improbable that the use of the coffee-leaf may yet extend very much.

Unroasted coffee has on an average the following percentage composition: water, 11.2; protein, 12.1 (including caffeine, 1.2); fat, 12.3; nitrogen-free extract, 42.3; crude fibre, 18.2; ash, 3.9. Roasted coffee contains per cent.: water, 1.1; protein, 14.0 (including caffeine, 1.2); fat, 14.5; nitrogen-free extract, 45.8; crude fibre, 19.9; ash, 4.7. Of the total material, some 25 per cent. is soluble in water, half of this being nitrogen-free extract. When the beans are roasted till they assume a reddish-brown color, they lose 15 per cent. by weight, and gain 30 per cent. in bulk; when roasted till they become chestnut-brown, they decrease 20 per cent. by weight and increase 50 per cent. in bulk; while if the roasting is continued till the beans become dark-brown, they lose 25 per cent. in weight and acquire 50 per cent. in bulk. The beans should never be darker than a light-brown color, which is quite sufficient to bring out the excellent aroma and other qual-

ities of the coffee; when the roasting is carried further, more or less charring is the result and a disagreeable burned smell is produced, which tends to overcome the natural pleasant aroma. The improvement in flavor by roasting is probably due, in part at least, to the formation of caramel. Coffee does not retard the action of the bowels, as strong infusions of tea tend to do, partly because there is less of the astringent principle, and also owing to the presence of the aromatic oil which tends to move the bowels. The important offices which coffee fulfills are, to allay the sensation of hunger; to produce an exhilarating and refreshing effect; and possibly to diminish the amount of wear and tear, or waste of the animal frame, which occurs more or less at every minute. (See NUTRITION.) The grounds of coffee are nutritious, containing considerable protein, and some of the Eastern nations take advantage of this. The coffee is ground very fine and allowed to remain in infusion, being consumed with it. In most respects coffee possesses properties similar to those of tea (q.v.).

An endless variety of apparatus has been contrived—some of them of great complexity—for preparing coffee for the table. The chief object aimed at by Western nations is, to obtain the liquor free from all sediment. In France and elsewhere a very popular beverage is prepared known as *café au lait*. Coffee and milk are boiled separately and mixed in equal proportions immediately before serving. In the so-called French coffee-pot, boiling water is poured very slowly upon the freshly and finely ground coffee, and then allowed to drip through two strainers into the bottom of the pot. This process makes excellent coffee, but is rather slow. Another and much quicker method, used by the Germans, is to infuse coffee like tea, and this has the advantage of bringing out the flavor. In using the Vienna coffee-pot, the water is poured through a pipe into a lower compartment of the pot. A drum with a strainer at the top is then fitted over the pipe, and in this drum the coffee is placed. A glass cover is adjusted over the pot, which is then placed over an alcohol flame. When the water boils, it rushes through the coffee and through the strainer and pours over the sides of the drum into the upper compartment of the pot, from which it is poured into the cups. The glass cover acts as a condenser of the steam and prevents the aroma from escaping. The nations of the Orient, generally, either follow the usage of the Turks, who drink their coffee thick with sediment; or the nomadic Arabs, who make it from the dried pulp, in much the same manner as tea is prepared in Occidental countries. A more curious method is that of the Somali, who boil the berries in oil, and soak maize in the mixture.

The trade in coffee is of great importance. Brazil leads in its production, exceeding all other countries combined. Large exportations are also made from Mexico, Central America, Java, Sumatra, India, Ceylon, Arabia, Hawaii, and the West Indies. The exportation of coffee in 1898-99 was 891,000 tons. Of this amount, Europe consumed 525,000 tons. The annual consumption of coffee in the United States is above 367,000 tons. The importation into the United States during the years 1895-99, inclusively, averaged 734,558,816 pounds, of the annual value of \$76,562,265.

Deducting the amount exported, the average consumption per capita is over 9 pounds.

Many sorts of cereal coffee are on the market. They are made of such materials as parched grains, peas, etc. On an average, they contain per cent.: water, 6.2; protein, 13.3; fat, 3.4; total carbohydrates, 72.6; ash, 4.5. Only a portion of this material is soluble and enters into the infusion. It is perhaps a fair statement that the infusion of genuine coffee and cereal coffee each contain on the average 98 per cent. water and 2 per cent. nutritive material. See ADULTERATION.

COFFEE-BUG. Any of several sorts of scale-insect which live on the coffee-tree. The pest is encountered in all parts of the world, and spraying with insecticides, or other means of eradication, are often necessary to save the crop. It is stated that some years ago the experiment was tried in Ceylon of introducing into the plantations a red ant (*Formica smaragdina*), abundant in many of the gardens and jungles of the island, which feeds greedily on the coccids; but the fierce assaults of the ants on the naked skins of the laborers made them threaten to leave the estates, so that the ants were not further encouraged.

COFFEE-HOUSE POLITICIAN, THE. A play by Fielding (1730).

COFFEE-HOUSES. Places of refreshment, first opened in the sixteenth century in Constantinople. In London they were, so to speak, club-houses free to all who could buy a cup; and yet each was known for its special circle of visitors, literary, scientific, religious, or political. In the absence of newspapers they were a great means of spreading news and of discussing public questions. Nearly all of the middle and higher classes attended them daily, and they came to exert so powerful an influence in politics that in 1675 Charles II. attempted to suppress them, but in vain. Consult Macaulay, *History of England*, vol. i. (New York, 1858).

COFFERDAM. A dam built to cut off a small body of water from the adjacent bay, river, etc. It consists of rows of piles, or piles and planking, the space between the rows filled in with clay, cement, or other material. The term is also applied to iron or steel air-tight inclosures used in digging under water tunnels or excavations. (See FOUNDATIONS, under *Cofferdam Process*.) On board modern ships the term is applied to inclosures designed to keep out water. They occasionally surround hatches, but their most important use is to form a continuous double wall to the sides of a ship. Above the protective deck the cofferdam is fitted as a continuous tank (with numerous bulkheads dividing it into sections), extending from that deck to several feet above the water-line. It is packed, in the United States Navy, with compressed corn-pith cellulose, which is designed to check the influx of water through a shot-hole, which it does by swelling up, as soon as wetted, and closing the hole. If the hole made is not too large or the pressure of water too great, it operates very satisfactorily.

COFFEYVILLE. A city in Montgomery County, Kan., 170 miles south by west of Kansas City; on the Verdigris River, and on the Missouri Pacific, the Atchison, Topeka and Santa Fé, the Missouri, Kansas and Texas and other railroads (Map: Kansas, C 4). It contains a

fine Railroad Y. M. C. A. building with a library. The city carries on an extensive trade with Indian Territory, and has strawboard, planing, and flour mills, brick and pottery works, and a plow-factory. Settled in 1869, Coffeyville was incorporated two years later. The government, under a charter of 1887, is administered by a mayor elected biennially and a city council. The water-works and the electric-light plant are owned and operated by the municipality, and there is a natural-gas plant operated under franchise. Population, in 1890, 2282; in 1900, 4953.

COFFIN. In ordinary sense, a burial-case; usually a box or chest, in which the dead are inclosed for interment, or sometimes for cremation. In modern times the ordinary material of the case is wood, usually with metallic attachments; lead, copper, iron, glass, terra-cotta, stone, etc., are sometimes employed. In earlier times the coffin was chiefly symbolic rather than merely utilitarian, and the material and form varied widely; and the early customs find parallels and interpretations among those of primitive peoples still surviving. Perhaps the simplest type of burial-case is that of the Seri Indians (q.v.); among them the body of a deceased matron is dressed and decorated, folded in small compass in a shallow grave (perhaps floored with a large turtle plastron), supplied with food and implements, and then covered with a large carapace; this shell of a tutelary deity being regarded as a protection, both actual and symbolic. Among the Papago Indians a corpse is merely enshrouded in all the habiliments of life, and then placed in a miniature 'house of the dead' made of stone or wood in imitation of a dwelling; and this type grades among various peoples into eists (q.v.) of slabs, rock-hewn sepulchres, ornate tombs, and massive sarcophagi. Among riparian and maritime peoples of lowly culture the canoe or boat is the symbol of the home, and the body of a deceased owner may be placed in his vessel, which is portable, and may be borne to a chosen place of sepulture; and it is this type of burial-case which can be traced through the customs of many peoples to the ordinary coffin of modern times. See BURIAL; MUMMY-CASE; SARCOPHAGUS; and MAN, SCIENCE OF.

COFFIN, CHARLES CARLETON (1823-96). An American war correspondent, novelist, and juvenile writer, born at Boscawen, N. H. Beginning as a farmer's boy, he tried civil engineering; then returned to farming, then became an expert telegrapher, and finally undertook journalism in Boston. He first attained distinction during the Civil War, as correspondent in the field for the *Boston Journal*. He served that newspaper also during the Austro-Prussian War of 1866, and in a journey round the world. On his return he became popular as a lecturer, and was a member of the Massachusetts Legislature (1884-85). Among his many books are: *The Great Commercial Prize* (1858), advocating a transcontinental railroad corresponding with the present Northern Pacific; *Days and Nights on the Battlefield* (1864); *Following the Flag* (1865); *Winning His Way* (1865); *Four Years of Fighting* (1866); *Our New Way Round the World* (1869); *The Seat of Empire* (1870); *Calch Krinkle* (1875); *History of Boscawen* (1877); *Boys of '76* (1879); *Story of Liberty*

(1879); *Old Times in the Colonies* (1880); *Life of Garfield* (1880); *Building the Nation* (1883); *The Drum-Beat of the Nation* (1887); *Marching to Victory* (1888); and *Freedom Triumphant* (1891). Coffin was distinguished for his interest in labor legislation and economic questions. He had a facile style and a vein of characteristically New England humor that secured for his books a wide popularity. Consult Griffin, *The Life of Charles Carleton Coffin* (Boston, 1894).

COFFIN, SIR ISAAC (1759-1839). A British admiral, born in Boston, Mass. He entered the British Navy in 1773, served in the American Revolution, and rose through all grades to the rank of admiral (1814). In 1818 he was elected to Parliament, where he remained until 1826. In the latter year he founded and endowed, on the island of Nantucket, a school which is still called by his name.

COFFIN, JAMES HENRY (1806-73). An American mathematician and meteorologist, born at Williamsburg, Mass. He graduated in 1828 at Amherst College, and in 1829 opened at Greenfield, Mass., the Fellenburg Manual Labor Institution, the first school of the sort in New England, and probably in the country. From 1846 until his death he held the chair of mathematics and astronomy at Lafayette College. His scientific attainments were notable. He erected on Mount Greylock, at a height of about 4000 feet above sea-level, an observatory, where careful observations were made by means of a self-registering anemometer of his own device. In 1846 he was appointed one of the first collaborators in the work of the Smithsonian Institution, under whose auspices he published *Winds of the Northern Hemisphere* (1853)—his chief volume, based on data collected from more than six hundred stations on land and at sea; *Psychometrical Tables* (1856); and *The Orbit and Phenomena of a Meteoric Fire Ball* (1869). The theory of atmospheric circulation, known on the Continent as the Buys-Ballot (q.v.) Law, was announced by him in 1853 at a meeting of the American Association for the Advancement of Science. His further works include *Solar and Lunar Eclipses* (1845), and *Elements of Conic Sections* (1849).

COFFIN, JOHN HUNTINGTON CRANE (1815-90). An American astronomer. He was born in Wiscasset, Maine, graduated at Bowdoin College in 1834, and in 1836 was appointed professor of mathematics in the United States Navy. In 1844 he was detailed to the Naval Observatory. He was professor of astronomy and navigation in the United States Naval Academy from 1853 to 1865, and from 1866 was in charge of the *American Ephemeris and Nautical Almanac*. He published a number of papers, mostly on astronomy.

COFFIN, JOSHUA (1792-1864). An American antiquarian, born at Newbury, Mass. He graduated in 1817 at Dartmouth College, and afterwards became an instructor of the poet Whittier, who paid tribute to his memory in the poem "To My Old Schoolmaster." He was a founder of the New England Antislavery Society, of which he became the first recording secretary. He published a *History of Ancient Newbury* (1845).

COFFIN, LONG TOM. A simple, daring sailor in *The Pilot*, by J. Fenimore Cooper, one of the strongest delineations of a sailor character in literature.

COFFIN, WILLIAM ANDERSON (1855—). An American landscape painter, born at Allegheny, Pa., January 31, 1855. He studied at the Yale Art School, and was afterwards a pupil of Bonnat in Paris. His work represents the different moods of nature in rural scenery, and his first successes were in depicting moonlight effects in the country—placid farmhouses and hillsides in lunar light. His picture, the "Rain," was purchased by the Metropolitan Museum. The success of many art movements has been due to Mr. Coffin's activity in organization. He was the art director of the Pan-American Exposition of 1901, at Buffalo. He has been the recipient of various medals at American exhibitions, and obtained a bronze medal at the Paris Exposition of 1889. He is well known as a writer on art topics in the leading magazines.

COFFINHAL, kō'fê-nâl', JEAN BAPTISTE (1754-94). A French Revolutionist. He was born at Aurillac, Cantal, and after studying medicine and the law, became a lawyer in Paris. He was for some time president of the Jacobin Club, and in 1792 was successively appointed justice and vice-president of the Revolutionary Tribunal. It has been said that in sentencing Lavoisier to death he used the words, "The world has no longer any use for chemists." Later he became implicated in the fall of Robespierre, and although he succeeded in effecting his escape to the Ile des Cygnes, he was betrayed by a friend, summoned before the Revolutionary Tribunal, and shortly afterwards condemned and executed.

COGALNICEANU, kô-gâl-nê-châ-ân', MICHAEL (1817-91). A Rumanian statesman and historian. He was born at Jassy, and was educated at Lunéville (1834) and Berlin. Upon his return he became one of the most active members of the party agitating for the union of Moldavia and Wallachia into a single Rumanian principality, a party which subsequently supported him faithfully. In 1840 he founded the journal *Dacia Literara*, and somewhat later the powerful unionist organ, *Stena Dunărci*. Upon the establishment of the union under Prince Cusa (1859) he was prominent in national affairs, and as Minister of Public Instruction he founded in 1860 the University of Jassy. Under Charles of Hohenzollern, Cogalniceanu was Minister of the Interior from 1868 to 1870; was Minister of Foreign Affairs at the time of the Russo-Turkish War (1877-78), participating in the Congress of Berlin; again Minister of the Interior in 1879-80, and Minister plenipotentiary at Paris (1880-81). He distinguished himself by his zeal in the cause of educational, legislative, and political reform.

COGHETTI, kô-gêt'tê, FRANCESCO (1804-75). An Italian painter. He was born at Bergamo, was a pupil of Camuccini in Rome, where he settled permanently, and was for a number of years president of the Academy of San Luca. He devoted himself especially to the study of Raphael, and is recognized as the head of the modern Italian school, which strove to restore the classical styles of painting. He executed many altar-pieces for churches, and fresco-paintings for palaces in Bergamo, Rome, and

Savona, notably "The Exploits of Alexander the Great," in the Villa Torlonia, Rome; "The Triumph of Bacchus," "Battle of the Amazons," and "The Four Elements," in the Palazzo Torlonia, Rome; "The Myth of Cupid and Psyche" and "The Parnassus of Famous Men," in the Villa Torlonia at Castel Gandolfo. His frescoes in the Basilica at Savona also deserve especial mention.

COGHLAN, kŏg'lan, CHARLES FRANCIS (1841-99). A comedian, of Irish parentage. He was born in Paris, France, and educated for the bar, but adopted the stage, making his first appearance at the Haymarket, London, in April, 1860. After having been leading man of the Prince of Wales's Theatre, he came to America in the autumn of 1876, and played at the Fifth Avenue Theatre, New York City, under Augustin Daly. He was leading man at the Union Square Theatre during the run of *The Celebrated Case*. He appeared at Wallack's Theatre with his sister, Rose; played engagements with Mrs. Langtry (1885-91); created Alec d'Urberville in Mrs. Fiske's production of *Tess of the d'Urbervilles* (1897) and successfully produced (1898) his *The Royal Box*, a version of Dumas's *Kean*. Among his other plays are: *Lady Baxter*; *A Quiet Rubber*; and *Citizen Pierre*. The last he produced without success in the year of his death, which occurred in Galveston, Tex. Coghlan was one of the most graceful yet forceful of modern actors, equally at home in old English comedy and in modern emotional rôles. Consult Clapp and Edgett, "Players of the Present," in the *Dunlap Society Publications* (New York, 1899).

COGHLAN, ROSE (1853—). An English American actress, sister of Charles Coghlan. She was born at Peterborough, England, and her theatrical career began at the Greenock Theatre, Scotland, where she appeared as one of the witches in *Macbeth*. She was first induced to come to America by E. A. Sothern in 1871, and appeared in burlesque at Wallack's Theatre, New York, during the season of 1872-73. From 1873 to 1877 she was again in England, where she played for a time with Barry Sullivan, and had very successful runs in *Twelfth Night* and a piece called *All for Her*. In 1877 she reappeared at Wallack's; the following year she was the Countess Zicka in the first American presentation of *Diplomacy*. In 1880 she made a great hit as Stephanie in *Forget-Me-Not*. She remained at Wallack's Theatre most of the time till 1888, when she played Lady Teazle in *The School for Scandal*. Her répertoire there included a wide range of characters, which she acted with great resource of feeling and technique. Since then she has starred and has appeared in several large melodramatic productions. Consult: McKay, *Famous American Actors of Today* (New York, 1896); Strang, *Famous Actresses of the Day in America* (Boston, 1899).

COGIA HASSAN ALHABBAL, kŏgyâ hās'sân al-hāb'bāl. One of the tales of the *Arabian Nights*. The hero is a rope-maker who becomes wealthy by finding a large diamond inside a fish.

COGIA HOUSSAN, hŏōs'sân. In the story of "Ali Baba and the Forty Thieves," in *The Arabian Nights*, the captain of the Forty Thieves, detected and slain by Morgiana.

COGNAC, kŏ'nyák' (Lat. *Condac*, Gall. *Condac*, confluence, from *con*, Lat. *cum*, together + *de*, Skt. *dhā*, to place). A town in the Department of Charente, France, picturesquely situated on an old castle-crowned hill overlooking the river Charente, 31 miles west of Angoulême by rail (Map: France, F 6). Cognac is celebrated as the place where the famous Cognac brandy is manufactured. The cultivation of the vine and distillation of brandy form the chief industry of the inhabitants of the district. Francis I. was born here in 1494. Population, in 1901, 19,483.

COGNATE (Lat. *cognatus*, cognate, from *co*, together + *gnatus*, born, from *nasci*, to be born; connected with Gk. *γενεσθαι*, *gignesthai*, Skt. *jan*, to be born). A term applied to relatives of the female branch of a family. It is most commonly employed in the civil (Roman) law, and in its technical sense did not come into general use in the English law. In many systems of law cognates rank next after agnates in the inheritance of property. The term is not generally used in the United States. See AGNATE; DESCENT; INHERITANCE.

COGNIARD, kŏ'nyār'. CHARLES THÉODORE (1806-72) and JEAN HIPPOLYTE (1807-82). Two French dramatists and theatrical managers. They were brothers, and wrote in collaboration a great number of fairy plays, vaudevilles, and other light pieces, which were unusually successful. Their first success was *La cocarde tricolore* (1831), which was played nearly two hundred times. Among the operettas produced at the Variétés, under the management of Hippolyte Cogniard, were *La belle Hélène*; *Barbe-bleu*; *Périchole*; and *la Grande Duchesse*.

COGNIET, kŏ'nyá'. LÉON (1794-1880). A French painter, born in Paris. He studied under Guérin, and won the Prix de Rome in 1817. His work attracted no particular attention until his "Marius Among the Ruins of Carthage" was exhibited in 1824. This picture was bought by the French Government. "Saint Etienne Carrying Help to a Poor Family" (1827) is another excellent example of Cogniet's style. His other works include a ceiling in the Louvre, "The Expedition to Egypt," and his masterpiece, "Tintoretto Painting the Portrait of His Dead Daughter" (1845). His portraits include those of Maréchal Maison (1831), Louis Philippe, Pierre Guérin (1831), and of M. de Crillon (1852). He was a noted teacher and the founder of a well-known school, the painter Bonnat having been one of his pupils.

COGNIZANCE (Lat. *cognitio*, investigation, inquiry, from *con*, with, and *nosco*, know). (1) An old term of the common law signifying jurisdiction, acknowledgment.

Cognizance of Pleas was jurisdiction of causes, a privilege granted by the King to a city or town to institute a tribunal for the trial of suits. Sometimes such a jurisdiction was conferred to the exclusion of that of the regular tribunals of the kingdom. It was by such a grant that the universities of Oxford and Cambridge acquired their legal jurisdiction. It is in this sense that the expression *claim of cognizance* is used, when one court intervenes to assert jurisdiction over a cause which has been wrongfully instituted in another court. The term is not employed in this special significa-

tion in the United States, though it occurs in the general sense of jurisdiction, as in the expression "to take cognizance of a cause of action." See JURISDICTION.

In pleading, cognizance signifies a formal acknowledgment of an act alleged, as in replevin, an acknowledgment of the taking of the goods sought to be recovered; and in the fictitious process known as 'levying a fine,' an acknowledgment by the defendant that the lands claimed are the property of the claimant. See FINE; REPLEVIN; PLEADING.

(2) A term in heraldry, used in a loose manner, sometimes to signify a crest (q.v.) and sometimes a badge (q.v.) or other distinguishing mark.

COGNO'MEN (Lat., from *co-*, together + *nomen*, name, Gk. *ὄνομα*, *onoma*, Skt. *nāman*, Ger. *Name*; connected with Lat. *gnoscere*, Gk. *γινώσκειν*, *gignōskein*, Skt. *jñā*, Ger. *kennen*, Engl. *know*). Equivalent to family name or surname. A Roman of social position ordinarily had three names, the last being his cognomen and the name by which his family was known. In Marcus Tullius Cicero, the first name is the *prænomen*, or personal name; the second the *nomen*, or name of the gens; and the third denotes the family, or branch of the gens.

COGNOSCEN'TI. See CONNOISSEUR.

COGNO'VIT (Lat., he has acknowledged). A written confession of liability by the defendant in an action authorizing the plaintiff to enter judgment for a specified sum, either absolutely or upon terms as to time of entry or payment. It is given only after the action is begun, and before the defendant has answered or otherwise pleaded, and in this respect differs from a confession of judgment, now used in England and in most of the States of the United States, which is given before the action is commenced, but is about the same in form. As originally used, the *cognovit* is superseded in almost every jurisdiction to-day by an order of the court entered on consent. It is still in use in some of the States of the United States where common-law pleading is still retained.

COGS'WELL, JOSEPH GREEN (1786-1871). An American librarian and bibliographer. He was born in Ipswich, Mass., graduated at Harvard in 1806, and studied law, but preferred to teach, and became a tutor at Harvard in 1814. With George Ticknor he spent two years (1816-18) at the University of Göttingen, where he paid special attention to the methods and principles of instruction. In 1820 he was made professor of mineralogy and geology and librarian of Harvard College, and in 1823, with George Bancroft, founded the Round Hill School at Northampton, Mass. He removed to New York, to become editor of the *Review* in that city, in 1836; continued in that work until 1842; became a personal friend of John Jacob Astor, and was appointed one of the trustees of the fund to create the Astor Library. He was, besides, the chief adviser of the philanthropist in planning this library. He became superintendent in 1848, and went abroad to purchase volumes for the collection. His general bibliographical knowledge was of great service to the library, one great work undertaken by him being the preparation of an analytical and alphabetical catalogue of the collection. He contributed valu-

able papers to periodicals, and numerous specimens to the botanical and mineralogical collections at Harvard. Consult Ticknor (editor), *Life of Joseph Green Cogswell, as Sketched in His Letters* (Cambridge, Mass., 1874).

COGSWELL, MASON FITCH (1761-1830). An American physician, adopted son of Samuel Huntington, president of the Continental Congress. He was born in Connecticut, graduated at Yale in 1780, and settled in Hartford, where he was instrumental in establishing the first asylum for the deaf and dumb in America. He was also a founder of the Connecticut Retreat for the Insane at Hartford, and introduced into America the methods of removing a cataract from the eye, and of tying the carotid artery (1803).

COG-WHEEL. See GEAR-WHEEL.

COHABITATION (from Lat. *cohabitatio*, from *cohabitare*, to dwell together, from *co-*, together + *habitare*, to dwell. The act of a man and woman in living together as husband and wife. Cohabitation does not necessarily involve the notion of sexual intercourse, and, in a strict legal sense, as applied to husband and wife, may mean only *consortium*, and not *concubitus*; but the term is commonly held, even in law, to carry with it the latter implication, and this is always so where the parties are unmarried. It raises a legal presumption of marriage between the parties cohabiting, which may, however, be rebutted by other evidence. See MARRIAGE, and the authorities there referred to.

COHEN, kō'en. EMIL (1842—). A German mineralogist, born in Jutland. He studied in the universities of Berlin and Heidelberg, and from 1867 to 1872 was assistant in mineralogy in the latter university. He then spent a year and a half in South Africa, and after devoting the following years to mineralogical studies and to the preparation of works descriptive of his African explorations, became professor of petrography in Strassburg in 1878. In 1885 he was made professor of mineralogy in Greifswald. His published works include the following: *Geognostisch-petrographische Skizzen aus Südafrika* (1874); *Erläuternde Bemerkungen zur Routenkarte einer Reise von Lydenburg nach den Goldfeldern und von Lydenburg nach der Delagoabaai im östlichen Südafrika* (1875); and *Sammlung von Mikrophotographien zur Veranschaulichung der mikroskopischen Struktur von Mineralien und Gesteinen* (1881-83; 3d ed., 1899).

COHEN, HENRI (1808-80). A French numismatist, born at Amsterdam, Holland. For a number of years, he held the post of curator of the numismatic collection in the National Library in Paris. He is known as the author of two highly valuable works, *Description générale des monnaies de la république romaine* (1857), and *Description historique des monnaies frappées sous l'empire romain* (7 vols., 1859-68; 2d ed., prepared by Feuardent, 1880 et seq.).

COHEN, HERMANN (1842—). A German philosopher, born at Cösing. As one of the leaders of the Neo-Kantian movement (see NEO-KANTIANISM), he did perhaps as much as any other follower of Kant to make the Critical Philosophy better known to students. This he has accomplished by banishing the 'thing-in-itself' from his system, and bringing philosophy

into closer connection with the sciences. His contributions to the interpretation of Kant's writings are of permanent value. His works include *Kant's Theorie der Erfahrung* (2d ed. (1895); *Kant's Begründung der Ethik* (1877); *Platon's Ideenlehre und die Mathematik* (1879); *Ein Bekenntniss und die Judenfrage* (1880); *Die Nächstenliebe im Talmud* (1884); *Kant's Begründung der Aesthetik* (1889).

COHERER (from *cohere*, from Lat. *cohære*, to cling together, from *co-*, together + *hære*, to cling). An instrument invented in 1890 by Professor Branly, of Paris, for the detection of so-called 'electrical waves,' that is, of waves in the ether produced by electrical oscillations. (The principle of this action had been discovered before by Varley and Calzecchi-Onesti.) It consists essentially of a tube containing minute filings of some metal, into each end of which a wire enters for a sufficient distance. It has been observed that under ordinary conditions such a tube does not allow an electric current to pass; but, if electrical waves fall upon it, a current can be passed most easily, thus affording a simple means of telling when electrical waves are passing. One explanation is that, when put in the tube loosely, the filings do not make electrical connection, owing to thin surface layers of condensed gases, etc.; but under the action of the electrical waves these layers are cleaned off, possibly by minute sparks passing between the filings, and thus establishing metallic connection through the tube. If, after the waves have passed, the tube is tapped forcibly, the filings are knocked apart, and the tube again becomes a non-conductor. The metals whose filings are used ordinarily are silver and nickel. Others might be used, but it has been shown that with some substances the electrical resistance is increased by the waves, not decreased. See WIRELESS TELEGRAPHY.

COHESION (Fr. *cohésion*, It. *coesione*, from Lat. *cohære*, to cling together). The name given to that property of matter observed when two portions of the same matter are brought closely into contact; thus one speaks of the cohesion of water, meaning the forces manifest at any point in water owing to the mutual action of the molecules. Sometimes the word is used to express the phenomenon observed when two pieces of a solid are stuck together, such as two pieces of glass, two pieces of lead, etc. The forces of cohesion in a liquid are greatly affected by having substances dissolved in it, and, in short, by anything which affects the molecules or their arrangements.

COHN, kōn, FERDINAND JULIUS (1828-98). A German botanist, born at Breslau. He studied at the universities of Berlin and Breslau, became connected with the latter institution in 1850, and was made full professor there in 1872. His investigations concerned chiefly the physiology and morphology of plants, to our knowledge of which he made numerous contributions of the highest importance. Besides a number of papers on special topics of his science, his published works include the following: *Zur Naturgeschichte des Protococcus pluvialis* (1850); *Untersuchungen über die Entwicklungsgeschichte der mikroskopischen Algen und Pilze* (1853); *Neue Untersuchungen über Bakterien* (1872-75); *Die Pflanze, Vorträge aus dem Gebiete der Bo-*

tanik (2d ed., 1895-97). He also edited the *Beiträge zur Biologie der Pflanzen und der Kryptogamenflora Schlesiens*. One of his best-known contributions to science was the demonstration that bacteria are vegetal organisms. Consult Pauline Cohn, *Ferdinand Cohn, Blätter der Erinnerung* (Breslau, 1901).

COHN, GUSTAV (1840—). A German political economist. He was born at Marienwerder, and studied at Berlin and Jena. His tour through England in 1873 gave him the materials for his work, *Untersuchungen über die englische Eisenbahnpolitik* (1874). In 1884 he became professor of political science at Göttingen, and in 1892 served as a member of the Imperial Commission appointed to investigate the affairs and regulations of the Stock Exchange. His more important works include: *System der Nationalökonomie* (1885 and 1889; Engl. trans. in the *Economic Studies* of Chicago University) and *Zur Geschichte und Politik des Verkehrswezens* (1900).

COHNHEIM, kōn'hīm, JULIUS FRIEDRICH (1839-84). A German pathologist, born at Demmin in Pomerania. After studying medicine at several universities, including those of Berlin and Würzburg, he became connected with the pathological institute of the Charité, Berlin. In 1868 he was made professor of pathology at Kiel, from 1872 to 1878 was professor at Breslau, and during the last years of his life held a similar position at Leipzig. His published works include the following: *Untersuchungen über die embolischen Prozesse* (1872); *Neue Untersuchungen über die Entzündung* (1873); *Vorlesungen über allgemeine Pathologie* (1877-80); *Die Tuberkulose vom Standpunkte der Infektionslehre* (1881). Cohnheim was the first to demonstrate that pus consists largely of white blood-corpuscles, thus throwing much light on the nature of inflammations. Consult: Ponfiek, *Gedächtnisrede auf Cohnheim* (Breslau, 1884); also, Kühne's biographical sketch published with the *Gesammelte Abhandlungen von J. F. Cohnheim* (Breslau, 1885).

CO'HO (American Indian). A local name in Alaska for the silver salmon (*Oncorhynchus kisutch*). See SALMON.

COHOES, kō-hōz'. A city in Albany County, N. Y., nine miles north of Albany; at the junction of the Mohawk and Hudson rivers, and on the Delaware and Hudson and the New York Central and Hudson River railroads (Map: New York, G 3). The Erie and Champlain canals also pass through the city, uniting a short distance to the south. In this section of the Erie Canal there are several locks which lift the boats from the lower level of the Hudson Valley to that above the Mohawk Falls. The city is furnished with abundant water-power by the Mohawk, here crossed by a long railroad bridge affording a fine view of the falls, which are 75 feet high and 900 feet wide. A dam above the falls stores the water which is supplied by canals to the mills and factories. Cohoes is noted as a manufacturing centre, its industries including large cotton-mills, woolen-mills, knitting-mills, axe-factories, rolling-mills, and many other industrial establishments. Cohoes was for many years a part of the Rensselaer Manor. Its first settlers were Dutch, and probably came as early as 1630. It was incorporated as a

village in 1848, and in 1870 was chartered as a city. Population, in 1890, 22,509; in 1900, 23,910.

CO'HORT (Lat. *cohors*, originally meaning inclosure, connected with Gk. *χορτός*, *chorotos*, garden. OIr. *gort*, sedge. Ger. *Garten*, garden. AS. *geard*, Engl. *yard*). A portion of a legion in the ancient Roman armies. Usually there were 600 men to a cohort, and ten cohorts to a legion (q.v.). See CENTURION.

CO'HOSH. The American Indian name of black snakeroot (*Cimicifuga racemosa*). It occurs in the United States from Maine to Wisconsin and south to Florida. The rhizomes, which are employed in medicine, contain resin, wax, tannin, and a crystalline principle. Alterative, sedative, and emmenagogue properties are attributed to it. See Plate with article SANGUINARIA.

COIF (from OF. *coife*, Fr. *coiffe*, It. *cuffia*, from ML. *cofia*, *coif*, from OHG. *chuppa*, cap under the helmet, from *chupf*, Ger. *Kopf*; connected with AS. *cuppe*, Engl. *cup*). (1) A covering for the head in general, but more especially for the circular portion on the crown, which certain of the Roman Catholic clergy in monastic orders are in the habit of shaving. (See TONSURE.) A special signification refers to the distinguishing mark of sergeants-at-law, which, though nothing but an insignificant black patch on top of the legal wig, is now the only reminiscence of the tonsure among English lawyers. On attaining the degrees of the coif, or becoming a sergeant, a barrister retires from the Inn of Court by which he was called to the bar and becomes a member of Sergeants' Inn.

(2) In the armor of the Middle Ages, a defensive hood, usually surmounted by a helmet, sometimes continuous with the hauberk, and sometimes separate.

COIMBATORE, kô-îm'bhâ-tôr', or **KOIMBATUR**, kô-îm'bhâ-tôor' (Telugu, also *Koimpadî*, *Koibmutur*, *Koiamutura*). A city in Madras, British India, capital of the district of the same name, situated near the left bank of the Noyel, a tributary of the Kavery, in latitude 11° N., longitude 77° 1' E. (Map: India, C 6). It lies 304 miles southwest of Madras, with which it is connected by rail. It occupies the south declivity of the Nilgiri, 1483 feet above the sea, and has a cool and healthful climate. The adjacent low-lying plains, however, are malarious and dangerous to health. The suburban Pagoda of Perur is an important archaeological structure. Population, in 1891, 46,400; in 1901, 53,000.

COIMBRA, kô-êm'brâ. A city of Portugal, capital of a district of the same name, in Beira, picturesquely situated, partly on a steep rock and partly in a plain, amid vineyards and orange orchards, on the right bank of the river Mondego, 110 miles north-northeast of Lisbon (Map: Portugal, A 2). The upper town is badly built, its streets being steep, narrow, and dirty. Of the public buildings, the most noteworthy are the cathedral, the churches of São Francisco and São Salvador, and the convents of Santa Cruz and Santa Clara. There is here a fine aqueduct of twenty-one arches, which dates from the sixteenth century. The famous University of Coimbra (q.v.) is the only university in Portugal. Coimbra has manufactures of linen, woolen, earth-

ware, and combs. Population, in 1890, 17,329. Coimbra was the Conimbrica of the Romans. In 1064 it was taken from the Moors by Ferdinand I., and for two hundred and fifty years (1129-1383) was the capital of Portugal. It was the scene of prolonged fighting between Masséna and Wellington in the campaigns of 1810 and 1811.

COIMBRA, UNIVERSITY OF. The State University of Portugal, and the only university in that kingdom. With some 1600 students in theology, law, medicine, mathematics, and philosophy, its library, hospitals, observatory, museums, and laboratories, it is an institution of great national importance. Its history is long and checkered. Founded in 1290 by the poet-king, Diniz, at Lisbon, a supplementary charter was issued in 1308, transferring it, because of dissensions between town and gown, to Coimbra, the first of a long series of migrations which make it unique among universities. From 1308 to 1380 it vibrated between Coimbra and Lisbon, in the latter year being settled at Lisbon. In 1537 it migrated again to Coimbra, where it has since remained. It was at the beginning of this last period that it reckoned Camoëns (see CAMÕES) among its members. Alone among Continental universities to-day, it preserves the mediæval academic dress; and in this, as in its architecture, traditions, and customs, it finds its only rivals in picturesque interest in Oxford and Cambridge. Consult Braga, *Historia da Universidade de Coimbra* (Lisbon, 1892).

COINAGE (from Engl. OF. *coin*, wedge, piece of money, from Lat. *cuneus*, wedge; connected with Gk. *κῶνος*, *kōnos*, cone, Skt. *sāna*, whetstone, from *śā*, to sharpen). Coins are pieces of metal designed to circulate as money, whose weight and fineness are certified by the impressions they bear. These impressions are the symbols of the authority by whose orders the coins are issued, but they also bear an important function in maintaining the integrity of the coin. To insure constancy in the weight of the coin it is necessary to protect it against clipping and against unnecessary wear and tear, or abrasion. The form of the coin is, in itself, a guaranty. Convenience of carriage, as well as greater durability, has given the preference to a rounded, generally a circular coin, over other shapes. Where, as in Japan, we find oblong coins, the corners are generally rounded off. The symmetry of outline guarantees the coin. This is heightened by milling the edges. Raised inscriptions serve the same purpose and do so better than incised letters, which are also used. The design upon the face of the coin is usually protected by raised edges, which project as much as the highest part of the design.

The importance of these features of modern coins in maintaining intact the weight of the coin by showing at once any attempted clipping, and by preventing the wearing off of surfaces by use, can best be appreciated by comparing them with the crude, irregular disks from which early coins were made, and the high relief of many of the designs upon them.

Gold and silver were used in settling accounts before coins were invented, but scales were a necessary adjunct of such transactions. Just as gold dust is weighed in the mining regions, so all exchanges effected by the metals before the introduction of coinage involved

weighing the metal used. The prevalence of exchange by weight is reflected in the correspondence, at least in their origin, between coins and measures of weight. To go back no further than the origin of English money, it is sufficient to recall that the monetary pound was once a pound weight of silver. This system was derived from the money of Charles the Great, and while in the subsequent development they departed widely from the original source, the monetary systems of modern Europe all trace back to the pound of silver.

The invention of coins, which, in classical antiquity, seem to have been first used in Lydia, did away in a measure with the necessity of weighing. In the multiplicity of Grecian States, coins were numerous, and while this was removed by the Roman Empire, it reappeared with the break-up of the Empire of Charles the Great. Not only did each nation make its own coins, but with the disintegration of central authority, nobles and cities usurped this right or had it conferred upon them by feeble monarchs. The multiplicity of coins restricted the area within which they were current. Outside of such areas they had no legal validity; they did not pass by count, but, if at all, only by weight. Certain coins, however, bore such an excellent reputation for uniformity and excellence of workmanship that they acquired an international circulation and passed generally by count or tale. As modern centralized States became strongly rooted, a unification of the coinage took place, and the numerous units disappeared. Improvements in the processes of coinage have made effective the certification of weight and fineness which coinage implies.

The right to coin money is a prerogative of the State and one of the foremost marks of sovereignty. The circulation of coins rests, in the first instance, upon the authority of the State; but that authority must be exercised in good faith. Coinage issued by individuals would lack authority and lack also the guaranty of good faith. There have been occasions of great dearth of money where private persons have issued coins. Such issues are known as tokens, and gain circulation either from their similarity to legal coins or from the promise of redeeming them. Their total lack of uniformity gives a picture of what might be expected were the issue of coins left wholly to private initiative. Almost equally obvious is the necessity for the manufacture by the State of the coins which it issues. To delegate the manufacture of its coins to a private establishment, as was done in France before 1879, requires such a minute control of all its operations by State officials that the plan has generally been abandoned. The greater integrity of a national mint over a private enterprise is further illustrated by the fact that the mints of the leading nations are frequently called upon to execute the coinage for smaller States which have no mints of their own. Thus, in 1901, the United States Mint executed a gold coinage for Costa Rica.

The metallic circulation of a country usually consists of standard coins and token coins, with respect to whose issue different rules prevail. The first are those of the standard monetary metal, and their coinage is usually free. This means that such coins are freely issued to individuals who bring bullion to the mint for

coinage. There may be a coinage charge or this transformation may be made gratuitously by the State. Gratuitous coinage, which prevails in England and the United States, is favored because it promotes the transformation of bullion into coin to meet the demands of trade. A coinage charge, as in France (7 francs 44 centimes per kilogram of gold, or 3437 francs), is justified on the ground that the value of the coin is greater than that of the bullion by the cost of production; and, further, that the policy of the Government should be to give reasonable ease to the transformation, but not to favor a constant oscillation between coin and bullion. The English language knows but one name, *seigniorage*, for such coinage charges, whether they merely cover the cost of coinage (Fr. *brassage*) or are high enough to involve a profit. High seigniorage charges upon the standard money metal defeat the purposes of free coinage and are no longer customary. See SEIGNIORAGE.

Token coins are those whose metallic value is less than their nominal value. As such coinage involves a profit to the State, the State reserves the right of issue to itself. (See MONEY for an exposition of the principles of such issues.) In the United States this applies to the silver, nickel, and bronze coins. The metallic value of the coin is no protection against its unauthorized issue by individuals, but this protection is secured by the laws punishing counterfeiting. The processes of manufacturing a good counterfeit are so complex and require such heavy machinery that the secret manufacture can hardly escape detection.

Important considerations in coinage legislation, apart from the larger monetary aspects, are to secure uniformity in the coin at its manufacture and to maintain the integrity of the coin in circulation. Absolute accuracy in weight and fineness for every coin issued is out of the question. The law therefore allows, in the manufacture of coin, a certain tolerance both of weight and fineness. Variations within these limits, over or under the standard fixed by the law, do not disqualify the piece from issue. In former days these limits were often set quite wide, and by systematically getting under rather than over the average, considerable profits were stolen from the coinage. This was one of the abuses of the old régime in France which awakened the ire of the legislators of the Revolution when they took the reform of the coinage in hand. It should of course be the object to make these limits as narrow as possible, with the idea that the deviations, one side or the other, should balance, so that for the mass of the coinage the legally established standard should prevail. In the United States the standard fineness for both gold and silver is 900, and no gold ingot showing a greater deviation than one-thousandth, or silver ingot with a greater deviation than three-thousandths can be used in coinage. As to weight, the rule for single pieces prohibits deviations of more than one-half a grain for the double eagle (516 grains legal weight) or eagle, or more than a quarter of a grain for the half-eagle. The law also provides that in "weighing a number of pieces together, when delivered by the coiner to the superintendent, and by the superintendent to the depositor, the deviation from the standard weight shall not exceed one-hundredth

of an ounce in \$5000 in double eagles, eagles, and half-eagles."

Every effort is made by watching the process of manufacture to insure the observance of these rules. Trial pieces of every lot of coin which passes through the mints must be reserved. Once a year an Assay Commission is appointed for the examination of these sample pieces, which are both weighed and assayed. The accuracy of the work of the United States mints is shown by the report of the Assay Commission for 1901 that the fineness of gold coins varied from 899.5 to 900.2, the legal limits being 899 to 901, while that of silver coins varied from 898.2 to 900.9, the legal limits being 897 to 903.

In the circulation of coins from hand to hand, the friction gradually wears the impressions off and reduces the weight of the coin. It is, therefore, customary for coinage legislation to determine the point at which the coin loses its legal validity. In the United States gold coins which have lost more than one-half of one per cent. of their weight in twenty years from date of issue, or proportional amounts for less periods, are legal tender only by weight. All such coins received by the Government must be recoined. The depreciation of coins by abrasion has, in earlier times, been a serious problem. By a familiar monetary law (Gresham's Law), full-weight money is always preferred for export, while the worn coin remains at home. If the home circulation is much worn, there is a great temptation to 'sweat' all the new coins which come from the mint for the profit of the transaction. Hence the necessity from time to time of general recoinage of the money in circulation. The Government calls in all outstanding coins of certain dates and replaces them with new coins, declaring, moreover, that after a certain date the coins not presented shall lose their legal-tender quality.

In England, coining, although a prerogative of the Crown, is regulated by Parliament. By the Constitution of the United States the power of coining money, regulating the value thereof, and of foreign coin is granted to Congress, and the several States are prohibited from coining money as well as from making anything but gold and silver coin a tender in payment of debts. The uttering of spurious coin, therefore, is a crime against the United States. It is also punishable by a State government as a cheat. Coin has been judicially defined as "a piece of metal stamped and made legally current as money." A counterfeit coin is one made falsely in imitation of the genuine, and intended to resemble or to pass for it. The mutilation or debasement of United States coin, as well as the fraudulent importation or use of spurious foreign coin, is a crime under Federal statutes. See COUNTERFEITING.

The works cited under MONEY contain much information in relation to coinage. Consult also *Reports of the Director of the Mint*, and *Coinage Laws of the United States*. See MINT; MONEY; NUMISMATICS; LEGAL TENDER.

COIR (Tamil *kayiru*, cord), or COCOANUT FIBRE. The fibre of the husk of the coconut palm. Coir is a corruption of a word meaning rope. Its manufacture has become an important industry, both in England and America. The fibre of the husk is divided into two classes—the ordinary fibre converted directly into mats, and

the so-called brush fibre, which lies just under the skin. The latter is packed under great pressure, and then shipped to the manufacturer. It is spun by special machinery, and produces a perfectly cabled yarn, which is woven into doormats or ordinary yard-matting. In 1901 the coir imported into the United States amounted to 3,901,384 pounds, valued at \$141,830. The refuse from coir is used for stuffing mattresses, and also in horticulture as a protection against insects for vines and young trees.

COIRE, kwär. See CHUR.

COIT, JAMES MILNOR (1845—). An American teacher, born at Harrisburg, Pa. He received his education at Hobart College, was connected for some time with the Cleveland Tube Works, and has for many years taught natural science at Saint Paul's School, Concord, N. H. He is a member of several learned and patriotic societies, and his publications include the following interesting works: *A Manual of Chemical Arithmetic* (1886); *Treatise on the X-Rays and Their Relation to Medical and Surgical Sciences* (1897); and *Liquid Air* (1899).

COIJTER, VOLCHER (1534-90). A Dutch anatomist, born at Groningen. He studied in France and in Italy, where he heard the lectures of Fallopius at Pisa, was city physician of Nuremberg, and later was attached as surgeon to the army of Johann Kasimir, Count Palatine of the Rhine. He is considered one of the founders of the science of pathological anatomy. Numerous anatomical discoveries are credited to him, including that of the superior muscles of the nose. His studies in osteology and myology are partially set forth in the volumes *Tabula Externarum et Internarum Humani Corporis Partium* (1573) and *Lectiones Gabrielis Fallopii* (1575), which are also interesting as revealing one of the earliest attempts at an examination of the internal structure of birds. Indeed, his table, *De Differentiis Avium*, included in the latter, is among the first ornithological classifications.

COJUTEPEQUE, kô-noo'tá-pá-ká. The capital of the Department of Cuscatlán, Salvador, about 15 miles east of San Salvador (Map: Central America, C 4). It is situated north of the volcano Cojutepeque, and near Lake Ilopango. The city has considerable transit trade. Cojutepeque, for a few years after 1854, when San Salvador was destroyed by an earthquake, was the seat of government of the Republic.

COKE (probably connected with *cake*). A hard, brittle, porous solid, of a blackish-gray color and more or less metallic lustre. It does not soil the fingers when rubbed, and gives no smoke when burning. It absorbs moisture from the air to a very great extent. In general, the operation of making coke consists of expelling by heat the gaseous elements of bituminous coal. The residue resulting consists chiefly of pure carbon, mixed with varying amounts of ash containing sulphur and phosphorus, and is known as coke. In the manufacture of illuminating gas, coke is produced as a by-product (see GAS, ILLUMINATING); but this method is inadequate to produce the requisite quality and amount, and the manufacture of coke is itself an industry of great and rapidly increasing importance. Coke, charcoal, and anthracite coal are the fuels most used in metallurgy, and of these coke possesses the advantages and is without the dis-

advantages of the other two. Its hardness enables it to sustain the weight of furnace charges, and its porosity helps to make it readily combustible. Charcoal is too soft, while anthracite coal, which is in reality a natural coke, is hard enough, but is so dense in structure that its combustion is slow and its calorific energy moderate. The superiority of coke is due to its cellular structure. The walls are hard and vitreous, and the tiny passages between afford free course for the oxidizing gases of the blast-furnace. Besides its use in metallurgy, coke is an important fuel in other industrial operations, and it is being adopted for locomotives on some railroads. In 1899 the Boston and Maine Railroad began using coke as a fuel. Its advantages are that it is smokeless and does not produce sparks, thus decreasing the number of fires caused by the locomotives. Coke is also employed as a filtering material in water and sewage purification, being used extensively for the latter purpose, particularly in English practice.

Not all bituminous coals can be made into coke, and much experiment and research on the part of chemists have been devoted to ascertaining the necessary constituents of a good coking coal. It appears that the coking property of coal is independent of the constituents, such as moisture, fixed carbon, ash, and sulphur, which it contains, and depends wholly upon the relations and volumes of the elements composing the *volatile combustible* matters of the coal. Just what these relations and volumes are has not been definitely shown. In Continental Europe, where the manufacture of coke has been very highly developed, only a poor quality of coal is available, and much ingenuity has been expended in constructing furnaces suitable for this inferior grade of material. In America there has been as yet an abundant supply of coal of the very best quality for coking purposes, the supply having been drawn chiefly from the Connellsville coal of Pennsylvania and the Pocahontas coal of Virginia. But with the increasing demand for coke for metallurgical and other purposes, the poorer grades of coking coal must be drawn upon.

The preliminary preparation of coal for the manufacture of coke is chiefly a cleansing and separating process. Some of the best coking coal requires no special treatment, but is charged into the coke-ovens direct from the mines. It is usually found advantageous, however, to break up the coal into small pieces, in order that the volatile matter may be utilized to the utmost extent. When the coal is not uniform in size, it is found that it cokes unevenly, the finer portion fusing much more rapidly. When there is much slate in the coal, it is necessary to wash it; the slate separating itself from the coal in the process of washing, on account of its greater weight. Fire-clay also will be separated and washed out. Before washing, however, it is necessary carefully to sort the coal according to size. Various machines of great efficiency have been devised for crushing, sorting, and washing coal ready for the ovens, which are described in great detail, as are also the different forms of coke-ovens, by John Fulton in his *Treatise on the Manufacture of Coke* (Scranton, Pa., 1895). Three general methods have been followed in the process of transform-

ing coal into coke. The first was the primitive and wasteful process, borrowed from the charcoal-burners, of *open-air burning*. The coal is simply piled in a rectangular heap on the ground, with longitudinal and vertical flues running through it, in which enough wood is placed to ignite the whole mass of coal. The fire is lighted at the base of the vertical flues, and gradually extends through the mass. When the mass ceases to flame it indicates that the gaseous matter has been expelled, and the fire is partially smothered by covering the heap with fine dust. Last of all, the mass is sprinkled with a hose, the water being at once converted into steam, which permeates the whole mass. This process of coke-making requires from five to eight days.

The second method of making coke, and one which is still largely employed, is in the *beehive oven*, many improvements in its construction having been made from time to time. As late as 1893, all of the 44,201 coke-ovens in the United States were constructed on the beehive plan. The chief advantage claimed for it is that it produces from prime coking coals the best quality of metallurgical fuel. A minor advantage is that water is applied to cool it, while the coke is still in the oven, after which the oven heat reduces the amount of moisture in the coke. The great disadvantage of the beehive oven is that, as ordinarily constructed, the valuable by-products—ammonia and tar—contained in the volatile matter are entirely lost. This oven is not adapted to inferior grades of coal. It derives its name from the dome shape of its interior. It is usually built of stone masonry, on a firm foundation, with its interior lined with specially designed fire-brick. The beehive oven is usually about 12 feet in diameter and 6 to 7 feet high in the centre. The coal is charged through a hole in the centre of the roof, and is leveled off to an even depth of about 23 inches. The fresh charge is fired by the heat remaining in the walls from the previous charge, and the combustion is supported by air admitted through the front door, over the top of the charge. The volatile matter in the coal is driven off by the heat and burned in the top of the oven, along with a portion of the fixed carbon. The source of heat being at the top, the coking process proceeds downward, and is effected by the partial combustion of the charge itself. In England, and in a few American plants, the volatile matter is gathered into a conduit and carried under boilers, to raise steam for pumping water and other purposes; but usually the gases escape directly into the open air and are wasted.

As early as 1766 attempts were made in Germany to save the by-products from coke-ovens. It is now accomplished in the *retort oven*, which was devised in Europe for the double purpose of saving the by-products and for utilizing for coke-making inferior grades of coal. Very slow progress was made in developing the process, and it was not until 1883 that it was put upon a paying basis. This was due to the unsatisfactory design of the early coke-ovens and to the low price of the by-products, on account of the supply from gas-works. In 1856 Knab of France built a group of retort coke-ovens which had for their object, in addition to the making of coke, the double purpose of separating the tar and ammonia from the gases generated, and of

then returning these gases to be burned in the flues to heat the ovens. The principal defect of these ovens was the failure to proportion the several parts to the quality of coal to be coked. This mistake was corrected by Carvès of France in the Knab-Carvès oven of 1873, which has proved a model for later ovens. Subsequent improvements were made by Albert Huessner in Germany and G. Siebel in France, in 1881. Coke produced in by-product ovens was regarded with distavor till Dr. Otto introduced improvements which were patented in 1883 and are embodied in the Otto-Hoffmann coke-oven, to which the Siemens regenerator is applied. In 1887 the Semet-Solvay oven for coking dry coals, or a mixture of pitchy and dry coals, came into notice. The Belgian ovens, designed for coking poor grades of coal, are also widely used in Europe.

The retort oven used in the Semet-Solvay process is a long, narrow chamber from 30 to 33 feet long, about 6 feet high, and from 15 to

the last traces of tar and ammonia are removed. The gas is now returned to be burned in the flues of the coke-oven; but as this consumes little more than half of that generated, the rest is available for other purposes. The tar is collected into tanks, and the ammonia is concentrated into a strong crude liquor or into sulphate of ammonia. A ton of coal will yield from 15 to 25 pounds of sulphate and 5 to 14 gallons of tar. The demand for these by-products is rapidly becoming greater, and in some of the most recent coke-ovens their manufacture is considered of more importance than the coke itself.

In Germany, 12,000 Otto-Hoffmann coke-ovens are in operation, of which 400 save the by-products and the remainder do not. There were, in 1901, in America, either completed or in course of construction, about 2000 such ovens. Of these only those in three plants attempt to save illuminating gas.

The accompanying table gives the yield in coke and other products of certain standard coals:

YIELDS OF VARIOUS COALS IN OTTO-HOFFMANN OVENS

AVERAGE OPERATING RESULTS	Coke, per cent.	Tar, per cent.	Sulphate, per cent.	Total Gas per 2000 pounds, cubic feet
Everett, Dominion coal.....	72.83	4.99	1.010	About 9,000
Glassport, Youghiogheny coal.....	75.60	5.07	1.100	" 9,000
Germany, Westphalian coal.....	74.50	3.70	1.280	" 9,600
DISTILLATION TESTS				
Connellsville coking coal.....	76.34	6.14	1.223	" 8,924
Pittsburg " ".....	68.25	4.38	.908	" 8,884
Eastern Pa. " ".....	85.00	2.00	.900	" 8,400
Virginia " ".....	66.01	4.70	1.070	" 10,090
Kanawha " ".....	73.60	6.40	1.000	" 10,289

20 inches wide, depending on the quantity of the coal to be coked. The ovens are built in blocks of from 25 to 34, separated by flues in which gas is burned, the heat from which cokes the coal. The charge is introduced through several openings in the top, the ovens are nearly filled, and then tightly sealed. As the heat in these ovens comes from the sides instead of the top, as in the beehive oven, the flow of gases generated is from the sides to the centre, while the free expansion of the coke is somewhat checked. As a result, some coals that in a beehive oven make a coke that is too soft and spongy for blast-furnace use, are hardened and strengthened in the retort oven so that they are able to bear the furnace burden. The ovens being so much narrower, the process of coking requires only half as much time as in the beehive furnace. When the charge is coked it is pushed out by means of rams through doors at each end, the doors are immediately closed, and the oven is ready for a recharge with almost no loss of heat. The coke is quenched as soon as it leaves the oven. The gases are conducted from the oven, through an opening in the top, into a collecting main. This is a hydraulic main, like that used in illuminating-gas works. The gas bubbles through the water, and a part of the tar and ammonia is condensed and separated as the gas cools, and then collected. The gas next passes through tubular condensers, where it is cooled by contact with a series of tubes through which cold water is flowing. During this process more ammonia and tar are condensed. The gas now goes through an exhauster, and, last of all, to a scrubbing apparatus, where

For a complete discussion of the coke industry, reference should be made to the "Mineral Resources of the United States," which form a part of the *Annual Reports of the United States Geological Survey*; and to Platt, "Special Report on Coke Manufacture," *Pennsylvania Second Geological Survey Report of Progress L* (Harrisburg, 1876); Fulton, *Coke: A Treatise on the Manufacture of Coke and the Saving of By-Products* (Scranton, 1895); Parker, *Manufacture of Coke in 1896* (Washington, 1897); Weeks, "Coke," in *United States Census Office Eleventh Report on Manufacturing Industries* (Washington, 1895). See AMMONIA; GAS; and TAR.

COKE, kuk or kōk. Sir EDWARD (1552-1634). A distinguished English lawyer and judge. He was born at Milham, in Norfolk, on February 1, 1552. Educated at the free grammar school at Norwich, and at Trinity College, Cambridge, he passed thence to Clifford's Inn, and subsequently to the Inner Temple, to study law, and was called to the bar in April, 1578. His great ability, legal learning, and the tact he exhibited in the conduct of his cases, secured him a large practice on the very threshold of his career. In 1586 he was appointed recorder of Norwich, in 1592 recorder of London, a position he resigned the same year for the Solicitor-Generalship. In the following year he was elected member of Parliament for the county of Norfolk, and was chosen Speaker of the House of Commons. In 1594 he was made Attorney-General, and it was in this capacity that he conducted the prosecution in the famous State trials of Southampton

and Essex in 1601, of Sir Walter Raleigh in 1603 (in which he exhibited a brutal rancor and bitterness), and of the Gunpowder plotters in 1605. He held this office until 1606, when he was appointed Chief Justice of the Common Pleas, the duties of which position he discharged in a manner that secured for him a great reputation. Upright and independent, with a high notion of the dignity and importance of his office, he did not, in an age of judicial sycophancy, hesitate to oppose any illegal encroachment by royalty. At the suggestion of Bacon (between whom and Coke there was a long-standing hostility), James I., in order to bring him over, appointed Coke, in 1613, Chief Justice of the King's Bench, and shortly afterwards Privy Councillor. But here he proved equally incorrigible, among other things maintaining, in the *Comendams* case, that the King had no power to stay the proceedings in a court of justice, even after his more pliable colleagues had retracted and begged the royal pardon on their knees for having entertained and expressed that opinion.

This was too much. Coke, in a few months (November, 1616), was relieved from his Chief-Justiceship. His ardent and unflinching support of liberal measures in Parliament, especially of the right of freedom of debate, soon brought him into further trouble with the Court party, and in 1621-22 he suffered nine months' imprisonment in the Tower. In the third Parliament of Charles I. (1628) Coke took an active part in framing the celebrated *Petition of Right*, and it was in a great measure owing to his advocacy that the Lords were induced to agree to it. He died September 3, 1634. He had an extraordinary popularity, and his utterances and courage did much to contribute to the final result in the struggle between the Crown and the Commons. Yet he was of an intolerant disposition, and in religious matters and in his fear of the growth and influence of the Papal power he was fanatical. He is now best known for his law treatise, *Coke Upon Littleton*; or, *the First Institute*, a work of extraordinary learning and of great acumen, which is still, perhaps, the most influential and authoritative treatise on English law. His other works are the *Second, Third, and Fourth Institutes*; *The Complete Copyholder*; and *Reading on Fines*; while his collection of law reports, which made an epoch in the history of law on their appearance, are still of great value to the profession. Consult: Johnson, *Life of Sir Edward Coke* (2d ed., London, 1845), which is somewhat untrustworthy; also Woolrych, *The Life of Sir Edward Coke* (London, 1826); and the sketches of his life in Foss, *Judges of England*, vol. vi. (London, 1857), and in Campbell, *The Lives of the Chief Justices of England*, etc., vol. i. (London, 1849).

COKE, THOMAS (1747-1814). The first bishop of the Methodist Episcopal Church. He was born at Brecon, Wales; was educated at Oxford, and took orders in the Church of England in 1770. About 1772 he was converted, and showed great fervor; in 1776 he met Wesley for the first time, and after that began open-air preaching. In consequence of his revivalism, he was dismissed from his curacy of South Petherton, and attached himself to the Methodist Society. In 1782 he was appointed president of the Irish Conference, and two years later he was

made superintendent for America, with power to confer ordination, by the laying on of hands administered by John Wesley and two other clergymen of the Church of England. Charles Wesley, who had not been aware of the ceremony, and heartily disapproved of it, wrote the well-known epigram:

So easily are bishops made
By man's or woman's whim;
Wesley his hands on Coke hath laid,
But who laid hands on him?

In 1787, both Coke and Asbury, whom Coke had ordained, assumed the title of bishop, much to John Wesley's displeasure. They traveled together among the various conferences until the middle of 1785, when Coke returned to England. He made in all nine visits to America, and spent the rest of his life in active missionary work, in personal visitation in the United Kingdom and in America, and in the encouragement of enterprises for the Christianizing of Asia and Africa. After Wesley's death Coke was secretary of the British Conference, and, with Asbury, he edited *The Doctrine and Discipline of the Methodist Episcopal Church of America* (1787). In 1813 he applied unsuccessfully to Lord Liverpool and William Wilberforce to be appointed bishop for India. He was consumed with a desire to spread Christianity in India, and as the Government was unfavorable to missions by Dissenters there, he believed he could work more effectively in connection with the Church of England, to which, like many Methodist ministers, he himself belonged; but when he went, he represented the Conference. In the same year (1813) he sailed for Ceylon, but died of apoplexy on the voyage, May 3, 1814. He was of a very energetic disposition, and of remarkable executive abilities. He had the advantage of considerable personal means, which he spent freely in the cause. Among his works are a *Life of John Wesley* (1792); a commentary on the Scriptures (6 vols., 1803-08); *History of the West Indies* (3 vols., 1808-11). For his life, consult Etheridge (London, 1860).

COKES, BARTHOLOMEW. A well-drawn picture of a simpleton in Jonson's *Bartholomew Fair*.

COL, kôl (Fr., neck). In geography, a depression or pass in a mountain range. In those parts of the Alps where the French language prevails, the passes are usually named *cols*—as the Col de Balme, the Col du Géant, etc.

COLADA, kô-lá'dà. One of the two swords of the Cid, taken from the Count of Barcelona.

COLA-NUT, or KOLA-NUT. The seed—not properly the nut—of *Cola acuminata*, a large tree of the natural order Sterculiaceæ, native to western tropical Africa, cultivated in the West Indies, Brazil, and other tropical countries, where it has, to some extent, become naturalized. The seeds average about an inch in length, are brown or reddish-gray, slightly mottled, have an odor resembling nutmeg, and a bitter flavor when fresh, which becomes mildly aromatic with age. In the tropics, especially in the Sudan, where they are known as gurnuts, they are employed as a stimulant and as a remedy for tropical diarrhœa. The nuts contain from 0.7 per cent. to 2 per cent. of alkaloid caffeine (q.v.), and small amounts of tannin and theobromine. According to Knebel and Hilger, fresh cola-nut probably contains no caffeine at

all, but a glucoside, the fermentative decomposition of which yields caffeine, glucose, and colared.

COLBAN, kōl'bān, ADOLPHINE MARIE (1814-84). A Norwegian novelist, whose literary genius was developed late and by necessity. She was born in Christiania, December 18, 1814. Left a widow without resources in 1850, she went to Paris, where a friend published part of her correspondence as *Lettres d'une barbare*. These were received with such favor that she was led to essay fiction, and between 1869 and 1881 published seven volumes of tales, most of which were translated into German. *Jeg lever* (1877) is the most characteristic, but nearly all are charming for their sympathetic insight into Norwegian character.

COLBERG, kōl'bérk. See **KOLBERG**.

COLBERT, kōl'bár', JEAN BAPTISTE (1619-83). A French statesman, Minister of Finance under Louis XIV. He was born at Rheims, August 29, 1619, and served his apprenticeship in a woolen draper's shop. He afterwards went to Paris, and soon obtained a position in the War Office, where his tireless activity brought him into notice. He became secretary to Le Tellier, then at the head of the War Office, and through his influence was made a counselor of the King and introduced to Mazarin, who soon employed him in important affairs of State. On his deathbed Mazarin recommended Colbert to the King, who in 1665 appointed him Comptroller-General of the Finances. Colbert found the finances in a ruinous condition, and immediately entered upon an elaborate programme of reform. Fouquet, the Superintendent of Buildings under Mazarin, was found guilty of maladministration, and was imprisoned for life. The new Comptroller instituted a council of finance and a chamber of justice, to call to account the farmers of the State revenues, who were forced to yield up all the wealth of the Crown of which they had fraudulently possessed themselves. In twenty years the revenue rose to 116,000,000 livres, of which but 23,000,000 were spent in collection and administration, whereas before Colbert took the finances in hand the revenue had amounted to only 84,000,000 livres, of which 52,000,000 were absorbed in collection. Colbert did not rest satisfied with being a financial reformer, but in various ways developed the industrial activity of the nation by State support. He was created Minister of Marine in 1669, and shortly afterwards he acquired control of commerce, the colonies, and the royal expenditure. French trade was extended, and roads and canals—including the great canal of Languedoc—were built. Certain features of his economic policy, such as a too stringent regulation of commerce, high protective duties, and the maintenance of the corporation system, have been frequently criticised, but they were rather the faults of the age than of the man. He organized anew the colonies in Canada, Martinique, and Haiti, and founded those of Cayenne and Madagascar.

Perhaps the most successful of all Colbert's reforms was the creation of a French navy. He found France in 1669 with a few old hulks, and provided her in three years with a fleet of sixty ships of the line and forty frigates. The mercantile marine was also developed, and boun-

ties were given on ships built in France. Colbert revised the Civil Code, introduced a code of marine law, as well as the so-called *Code Noir* for the colonies. Statistical tables of the population were first made out by his orders. Men of learning and genius found in him a generous patron. The academies of inscriptions, science, and architecture were founded by him. In short, he appears as the promoter of industry, commerce, art, science, and literature—the founder of a new epoch in France. Notwithstanding his remarkable ingenuity, the unbounded extravagance of his master forced him to raise money in ways objectionable to his reason, and to maintain war taxes in time of peace. The last years of his life were a constant struggle to find money for Louis's ruinous wars, and he died September 6, 1683, bitterly disappointed because his great services were but ill appreciated by the King, whose confidence in Colbert had been undermined by the favorite Louvois. The people of Paris, enraged at the oppressive taxes, would have torn his dead body to pieces, but for the intervention of the military and his burial by night. He left large estates in France, and some of his offices descended to his sons, one of whom became Minister of Marine and another Superintendent of Buildings. A third was made Archbishop of Rouen. It is not the least of Colbert's merits that he saw the wisdom of Richelieu's tolerant course toward the Huguenots, and restrained the King from that fatal policy of persecution which began with the revocation of the Edict of Nantes (q.v.) soon after the great Minister's death. Among Colbert's posthumous papers were found *Mémoires sur les affaires de France* (c.1663), and a fragment, *Particularités secrètes de la vie du Roy*, which have been published several times.

Consult: Clément, *Vie de Colbert* (Paris, 1846); id., *Lettres, instructions, et mémoires de Colbert* (9 vols., Paris, 1861-82); id., *Histoire de Colbert et son administration*, edited by Mme. Clément (Paris, 1874); Gourdault, *Colbert, ministre de Louis XIV.* (Tours, 1885). Sargent, *Economic Policy of Colbert* (London, 1899), contains a bibliography of works relating to Colbert and his time. See **FRANCE**; **LOUIS XIV.**

COLBERT, JEAN BAPTISTE, Marquis de Seignelay (1651-90). A French statesman, Minister of Marine, and son of the famous Minister of Finance. In 1683 he succeeded his father as the head of the navy, and successfully continued the policy which raised that branch of public defense to high efficiency. He was ambitious of attaining success both as diplomatist and warrior, and personally led a naval expedition against Genoa in 1684.

COLBURN, kōl'búrn, WARREN (1793-1833). An American educator, born in Dedham, Mass. He graduated at Harvard in 1820, and in the same year opened a private school in Boston. His taste turned to mathematics, and in 1821 he published *First Lessons in Intellectual Arithmetic*, the sale of which far exceeded that of any previous mathematical work. It was translated into nearly all the languages of Europe, and into some of those of India. From teaching, Colburn went into manufacturing, and was superintendent of large establishments in Waltham and Lowell; but much of his time was

devoted to lecturing on commerce, natural history, physics, and astronomy. He published a *Sequel* to his arithmetic (1824), and an *Algebra* (1827).

COLBY, FRANK MOORE (1865—). An American editor and writer, born in Washington, D. C. He studied at the Columbian University in that city, and afterwards at Columbia University, New York, where he graduated in 1888 and received his master's degree in 1889. He was acting professor of history at Amherst College from 1890 to 1891, lecturer on history at Columbia and instructor in history and economics at Barnard College from 1891 to 1895, and professor of economics at New York University from 1895 to 1900. From 1893 to 1895 he was a member of the editorial staff of *Johnson's Cyclopaedia*, in the department of history and political science. In 1898 he became editor of the *International Year-Book* and one of the editors of the *International Cyclopaedia*, and two years later one of the editors of the *New International Encyclopaedia*. His other literary work has included editorial writing for the *Commercial Advertiser* (New York), critical articles for the *Bookman* and other magazines, and *Outlines of General History* (New York, 1900).

COLBY, THOMAS FREDERICK (1784-1852). An English engineer, connected with the British ordnance survey for forty-five years. He invented the 'compensation bar,' an apparatus used in base-measurements, consisting of a rod of brass and iron, the ends of which remain always at the same distance in spite of changes of temperature. In 1824 he planned, and from then until 1846 supervised, the survey of Ireland, an undertaking of great magnitude and importance. Consult Portlock, *Memoirs of the Life of General Colby* (London, 1869).

COLBY COLLEGE. An institution of higher education, founded by the Baptists of the District of Maine, and situated at Waterville, Maine. It was chartered by the Legislature of Massachusetts in 1813, and was known as 'The Maine Literary and Theological Institution' until 1820, when its name changed to Waterville College. In 1867 the name was again changed to Colby University, in honor of Mr. Gardiner Colby, whose gifts to the college amounted to \$200,000. The name of the institution was changed in 1899 to Colby College. The principal buildings of the college include Memorial Hall, Champlin Hall, Colburn Hall, the Shannon Observatory, and Chemical Hall. Colby College offers courses leading to the B.A. degree, without requiring Greek for entrance. Men and women are admitted on equal terms and pursue the same studies, though in separate classes. The courses are largely elective after the first year. The library numbers 37,000 volumes and 20,000 pamphlets. The number of students is about 200. The endowment funds of the college amount to over \$450,000, and the value of the college property is \$250,000.

COLCHAGUA, kól-ehä'gwá. A province of Chile, bounded on the north by the provinces of Santiago and O'Higgins, on the east by Argentina, on the south by the Chilean Province of Curicó, and on the west by the Pacific (Map: Chile, C 10). Area, 2795 square miles. The eastern and western parts are traversed by the Andes and the Coast Range respectively, while the middle section forms a part of the central valley

of Chile, the best-cultivated part of the country. The soil is well watered and of exceptional fertility, yielding corn, wheat, oats, and beans. Cattle-raising is carried on extensively. The province is traversed by the Santiago-Valdivia Railway. Population, in 1895, 157,566. Capital, San Fernando.

COLCHESTER, kól'chēs-tēr. A Parliamentary and municipal borough and river port of Essex, England, on the south bank of the Colne, 12 miles from the sea, and 51 miles northeast of London (Map: England, G 5). It is partly surrounded by the remains of an old Roman wall. The most notable building is the castle erected in the reign of William Rufus, with walls from 10 to 30 feet thick. The Norman keep is said to be the largest in England. The ruins of Saint Botolph's Priory are an interesting bit of Norman workmanship, and in the Holy Trinity Church Saxon features are found. The streets are well paved and lighted by electricity, supplied by the town, which also owns the water-supply. The town also maintains baths, recreation grounds, and markets. Its educational institutions include the Albert School of Science and Art and a public library. Colchester derives a considerable revenue from the oyster fishery in the Colne. Its corn markets are important, and its manufactures include boots and shoes. It has a quay for vessels of 150 tons at the suburb called Hythe. Population, in 1891, 34,600; in 1901, 38,400. Colchester is the *Camulodunum* of the British and Romans and the later *Colneceaster* (Colne Castle) of the Saxons. Great quantities of Roman remains have been found here, bushels of coins of many emperors, vases, urns, lamps, pavements, and baths. The town was ravaged by the plague in 1348, 1360, and 1665. In the Civil War, Colchester held out for the King, but was captured by General Fairfax after a three months' siege. Old King Cole of merry memory, according to the legend, gave the town its modern name. Consult: Cutts, *Colchester* (London, 1889); Round, "Colchester During the Commonwealth," in *English Historical Review*, vol. xv. (London, 1900).

COLCHESTER. A town in Chittenden County, Vt., containing the village of Winooski (Map: Vermont, B 3). Winooski is a manufacturing village, two miles from Burlington, on the Central Vermont Railroad. It is in an agricultural district, and has manufactures of cotton and woolen goods, metal goods, lumber and woodenware, carriages and wagons, screens, etc. Population (Winooski village, in 1890, 3659; in 1900, 3783); town, in 1890, 5143; in 1900, 5352.

COLCHESTER, first Baron. See **ABBOTT, CHARLES.**

COLCHICINE (Fr., from Lat. *colchicum*, Gk. *κόλχικόν*, *kolchikon*, the poisonous meadow-saffron, from Gk. *Κολχίς*, *Kolchis*, a country on the Black Sea), $C_{11}H_{15}NO_6$. A bitter alkaloid, the active principle of colchicum root, the corm of *Colchicum autumnale* (Linné), growing in southern and central Europe. It is a crystalline substance soluble in water, alcohol, and chloroform. Colchicum preparations are used in medicine to relieve pain in gout. In larger doses colchicine is poisonous, and even in medicinal doses may act as a powerful gastro-intestinal irritant and heart depressant, in which case its administra-

tion must be temporarily discontinued. The medicinal dose of colchicum root, which contains about 0.5 per cent. of colchicine, is from 2 to 8 grains, in powder. The dose of colchicum seed, which contains less of the alkaloid than the corn, is from 1 to 5 grains.

COLCHICUM, kól'kí-kúm (Lat., from Gk. κολχικόν, *kolchikon*, the poisonous meadow-saffron). A genus of plants of the natural order Liliaceæ, native to Europe and to the Mediterranean region. The species, of which there are about thirty, are stemless, with flowers half subterranean like the crocus, only the limb of the perianth and part of the tube rising above ground. The flowers much resemble crocus-flowers. The only British species is *Colehium autumnale*, the meadow-saffron, sometimes also, but incorrectly, named autumn crocus, which is plentiful in meadows and pastures in some parts of England and of the Continent of Europe. The flowers are pale purple; they appear in autumn unaccompanied by any leaves; the leaves, which are large and broadly lanceolate, appear in spring, when the stalk which bears the ripening fruit rises among them. The whole plant is very acrid and poisonous, chiefly owing to the presence of colchicine. Cattle are not infrequently injured by it in pastures where it abounds. It is, however, not difficult to extirpate, the repeated pulling of it by hand, as it appears above ground, being sufficient for this purpose; the roots soon become exhausted and die. It is a valuable medicinal plant, the parts chiefly used for medicinal purposes being the corn (popularly called the root) and the seeds. The seeds are round, brown, and rather larger than mustard-seed; and fatal accidents have occurred from their poisonous nature. Other species of *Colehium* appear to possess similar properties. (See COLCHICINE.) *Colehium autumnale* is common in flower borders, and a number of other species are employed in the same manner. Most of the species are autumn-blooming, a few flowering in spring along with the crocuses, snowdrops, etc. *Colehium luteum* is one of the finest of spring-flowering species, and *Colehium Parkinsoni*, *Colehium speciosum*, and *Colehium autumnale* of autumn-blooming species. For illustration, see Plate of CORNFLOWER.

COLCHIS, kól'kís (Lat., from Gk. Κολχίς, *Kolchis*). In ancient geography, a region on the east coast of the Pontus Euxinus or Black Sea, situated north of Armenia and south of the Caucasus. It corresponded very nearly to the Russian Government of Kutais. It was celebrated in the very earliest times as the native country of Medea (q.v.), and the goal of the Argonauts (q.v.), and was afterwards better known to the Greeks as the seat of some colonies of the Milesians. It was noted for its wine and fruits. The Colchians seem to have differed ethnologically from their neighbors, which led Herodotus to argue that they were descended from Egyptian invaders. Darius Hystaspes made them tributary to Persia; subsequently, they threw off their allegiance, and were ruled by kings of their own; the country then came under the dominion of Mithridates, King of Pontus; afterwards, there were princes of Colchis dependent on the Romans. The principal town was Dioscurias (called under the Romans Sebastopolis and now

Iskuriah); the principal river was the Phasis, now the Rion.

COLCOTHAR. See IRON, THE OXIDES OF.

COLD. See CATARRH.

COLDBATH FIELDS PRISON (named from *Coldbath Fields*, Middlesex). A London jail, erected in the time of James I., and sometimes referred to as the English Bastille. It is mentioned as the meeting-place of the rioters in Dickens's *Barnaby Rudge*. The prison became inadequate and was closed in 1886.

COLD CREAM. A term applied to preparations of fatty substances, which are used as mild and cooling dressings for the skin. The composition of an excellent cold cream is as follows: spermaceti (125 parts); white wax (120 parts); expressed oil of almonds (600 parts); strong rose-water (190 parts); and sodium borate (5 parts). Cold cream softens the skin and promotes the healing of wounds and of chapped hands.

COLDEN, kól'den. CADWALLADER (1688-1776). A Scotch physician who emigrated to America in 1708 and became well known in his profession. He practiced for ten years in Philadelphia, and then, in 1718, settled in New York City. He was the first surveyor-general of the Colony of New York, was a member of the provincial council, and in 1761 was appointed Lieutenant-Governor, which office he held until his death. As the Governors were often changed, Colden was frequently called upon to act as chief executive, and in this capacity came into conflict, upon many occasions, with the radical element of the 'patriot' party. He devoted much attention to the study of the sciences, and especially of botany, and was the first to introduce the Linnean system of classification into America. He published a *History of the Five Indian Nations of Canada* (1727), a work of great value, and a less important work on *The Principles of Action in Matter* (1752).

COLDEN, CADWALLADER DAVID (1769-1834). An American lawyer and politician. He was born near Flushing, L. I., and was a grandson of Cadwallader Colden. He studied law and attained considerable eminence at the New York bar. In the War of 1812 he was a colonel of volunteers. In 1818 he was chosen to the State Assembly, and in the same year succeeded De Witt Clinton as Mayor of New York City. He was elected to Congress in 1821, and from 1824 to 1827 was a member of the State Senate. Colden was one of Clinton's strongest supporters in the work of internal improvements, and was conspicuous in the cause of public education, the reformation of juvenile offenders, and other matters of moral and social betterment. He wrote a *Life of Robert Fulton* (1817); *Memoir of the Celebration of the Completion of the New York Canals* (1825); and *Indication of the Steamboat Right Granted by the State of New York* (1819).

COLD FRAME. See FRAME.

COLD HARBOR, BATTLE OF. One of the most sanguinary battles of the Civil War in America, fought June 1 and 3, 1864, at Cold Harbor, Va., about 10 miles northeast of Richmond, between the Federal Army of the Potomac, numbering about 102,000, under General Grant, and the Confederate Army of Northern Virginia, numbering about 65,000, under General Lee.

After fighting the battles of the Wilderness and Spottsylvania (q.v.), Grant proceeded toward Richmond, crossed the Pamunkey on May 28, and on June 1 found himself again face to face with General Lee. On the afternoon of May 31, the Federal general, Sheridan, with his cavalry, carried a position known as Old Cold Harbor, and held it in spite of the stubborn attacks of the Confederate general, Fitzhugh Lee, until night. On the following day he was relieved by General Wright with the Sixth Corps of the Army of the Potomac and Gen. W. F. Smith with the Eighteenth Corps of the Army of the James, who at 6 P.M. attacked Lee with great vigor in face of a terrible fire, and, with a loss of about 2000, succeeded in capturing a large part of the first line, the Confederates making a counter-assault, but with little effect, on the position of the Federal Fifth Army Corps under General Warren. Confederate attacks during the night failed to alter the relative positions of the two armies, and the following day was spent in readjusting the Federal lines. Warren being moved to the left to connect with Smith, Hancock being stationed on Wright's left, and Burnside taking up a position in reserve at Bethesda Church. At about 4.30 A.M. on the 3d, an assault was made 'all along the line,' the Federals fiercely attacking the impregnable entrenchments of the Confederates, but being driven back with terrific loss in less than thirty minutes. Most of the fighting ceased within an hour, the Federals having made comparatively little impression on the defenses, but having advanced their lines somewhat closer to the Confederate works. In their brief charge the Federals lost in killed, wounded, and missing fully 7000 men, more probably falling in the first ten minutes than in any other similar period throughout the war. General Hancock's corps suffered most severely. The two armies remained in their positions until the 12th, when Grant began his march for the James River. (See PETERSBURG.) The total loss sustained by the Federals during these twelve days, but chiefly on the first and third, was fully 12,700; while that of the Confederates, though never accurately ascertained, probably did not exceed 2500. For several days after the attack of June 3, great numbers of dead and wounded lay wholly unattended to between the two lines. Grant and Lee being unable to agree upon any plan for furnishing the needed relief. The battle considerably discouraged the Army of the Potomac, whose loss had not been atoned for by any corresponding gain; and military critics are almost unanimous in the verdict that the assault was the great mistake of Grant's career. General Grant himself afterwards said of it: "Cold Harbor is, I think, the only battle I ever fought that I would not fight over under the circumstances" (Young, *Around the World with Grant*, ii., 304, New York, 1879), and "I have always regretted that the last assault at Cold Harbor was ever made" (*Memoirs*, last ed., ii., 171). The battle of Gaines's Mill (q.v.) was fought in 1862 nearly on the site of that of Cold Harbor. Consult: *Personal Memoirs of U. S. Grant* (last ed., New York, 1895); Humphreys, *The Virginia Campaign of 1861 and 1865* (New York, 1883); and Johnson and Buel (editors), *The Battles and Leaders of the Civil War*, vol. iv. (New York, 1887).

COLD HARBOUR. An old London edifice near the Thames, once the property of a line of wealthy merchants, purchased about the middle of the sixteenth century by the Earl of Shrewsbury, and renamed Shrewsbury House. It was soon afterwards torn down, and the small buildings erected on its site became a place of refuge for debtors and bad characters.

COLDING, KÖLDING, LUDWIG AUGUST (1815—). A Danish engineer and physicist. He was born at Arnakke, studied at the Polytechnic Institute of Copenhagen, and was appointed a professor there in 1865. He also became connected with the water-system of Copenhagen in 1847, as inspector, and in 1858 as an engineer. In addition to many contributions to the *Reports* of the Scientific Society of Copenhagen and to scientific journals, he published *Tropical Cyclones* (1871), and other works.

COLD SPRING HARBOR. A village and summer resort in Suffolk County, N. Y., on Cold Spring Harbor, an inlet of Long Island Sound, noted for its fine scenery and an extensive trout hatchery.

COLDSTREAM. An historical border village of Berwickshire, Scotland, on the left bank of the Tweed, 15 miles southwest of Berwick, and on one of the main routes from Scotland to England (Map: Scotland, F 4). Population (police burgh), in 1901, 1482. Near Coldstream is the famous ford of the Tweed, where the Scotch and English crossed in former times, before the erection of Berwick Bridge. Here General Monk, 1659-60, raised the regiment still known as the Coldstream Guards (q.v.). Being a border town, Coldstream, like Gretna Green, was formerly celebrated for its clandestine marriages. About four miles to the south of Coldstream is Flodden Field (q.v.).

COLDSTREAM, Lady CATHARINE. A canny old watch-making Scotchwoman, who appears in Foote's *The Maid of Bath*.

COLDSTREAM GUARDS. A regiment of foot guards in the British Army, forming part of the Royal Household Brigade. It is one of the oldest regiments in the British service, dating from 1659. In that year General Monk, who after the death of Cromwell took sides with the Parliament and the army, organized the regiment at Coldstream, a border town of Berwickshire, Scotland, whence the name of the regiment, and marched with it into England. It has seen service in every British campaign of any magnitude, and has emblazoned on its regimental colors the names of many of the most brilliant victories of British arms. It was first known as Monk's Regiment, but when Charles II. ascended the throne, Parliament gave the regiment to him as part of his Household Brigade, and it has since borne its present name. See FOOT GUARDS; HOUSEHOLD TROOPS.

COLDWATER. A city and county-seat of Branch County, Mich., 125 miles west-southwest of Detroit, on the Lake Shore and Michigan Southern Railroad (Map: Michigan, H 6). It has manufactures of shoes, Portland cement, flour, and liniment. It is the seat of the State School for Dependent Children, and has a public library of 15,000 volumes. The city owns and operates its water-works and electric-light plant. Settled in 1830, Coldwater was incorporated in

1862. It is governed by a mayor, elected annually, and a city council. Population, in 1890, 5247; in 1900, 6216.

COLD WAVE. A term first applied by the United States Weather Bureau in 1872 to the areas of cold, clear, dry air that flow near the ground from Canada southward over the United States and become the so-called 'northers' when they reach the Gulf States, or 'Nortes' when they reach the Gulf coast of Mexico and Yucatan. The northers of Colon may possibly have a different origin. The cold stratum of air, being quite shallow, keeps to the lowlands and rarely rises to the 5000-foot level; there are but one or two cases on record in which it attained the altitude of Cheyenne or Santa Fé; often it is not deep enough to overflow the 3000-foot level of the Appalachian Range. The cold wave advances with a well-defined front, marked by a sudden fall of temperature and an outflowing wind that undoubtedly curls upward and overflows backward, forming an advancing border of clouds with spits of rain or snow. The barometric pressure underneath this cloud is a few hundredths of an inch higher than in front of it, and it is this difference of pressure that causes the mass of cold air to underflow and lift up the warmer air as it spreads southward toward the equator. This excess of pressure is in part caused by gravity or the hydrostatic pressure due to the weight of the air in the rear, and is also in part the result of the diurnal rotation of the earth on its axis, giving a centrifugal force to the denser cold air greater than that of the neighboring warm air. The progress southward or southeastward of the front of a cold wave is so steady that, having charted its position at several successive moments by means of telegraphic reports, the Weather Bureau has almost always been able to forecast its future progress with satisfactory accuracy, thereby enabling all interested in the matter to make provision against sudden drops in temperature, which often exceed 30° in twenty-four hours. According to the technical definition adopted by the Weather Bureau, the forecast of a cold wave (as made by hoisting the cold-wave flag) implies that there will be a drop of at least 20° within twenty-four hours, and that the temperature will go below freezing. Similar sudden changes in the warmer half of the year, when temperatures do not go below freezing, are simply cool waves.

COLE, COLESEED. See RAPE.

COLE, KING. A British king of the third century, who is said to have taken Camulodunn from the Romans and to have named it after himself Colchester. According to some of the old chroniclers, he was the father of the Empress Helena, mother of the Emperor Constantine. He is the subject of the well-known nursery rhyme, "Old King Cole was a merry old soul."

COLE, Mrs. In Foote's play *The Minor*, a character modeled on Mrs. Douglass, a notorious woman of the eighteenth century, who lived in Covent Garden. She feigns repentance, and her sudden change in character is designed to ridicule the Methodists.

COLE, Sir HENRY (1808-82). An English official, art critic, and editor. He was born at Bath, and was educated at Christ's Hospital.

Appointed assistant keeper of the records by Lord Langdale in 1838, he contributed by his writings to the establishment of a general record office. In 1845 he won the prize offered by the Society of Arts for a tea-service, and the design submitted by him afterwards became exceedingly popular. In 1846 he became a member of the Society of Arts, and by his efforts promoted those exhibitions of art manufactures (1847-48-49) which led to the great Crystal Palace exhibition in 1851. He was also one of the principal founders of the National Training School, which was opened May 17, 1876, and was subsequently reorganized as the Royal College of Music (1882). Under the pseudonym of Felix Summerly he wrote the works entitled *The Home Treasury* (1843-44); *A Handbook for . . . Westminster Abbey* (1842); *What Is Art Culture?* (1877).

COLE, SAMUEL WINKLEY (1848-). An American musician. He was born at Meriden, Conn., and studied at the New England Conservatory of Music, Boston, Mass. He was organist of Clarendon Street Baptist Church, Boston, from 1882 to 1884, and became teacher and superintendent of sight-singing at the New England Conservatory in 1883; supervisor of music at Brookline, Mass., in 1884, and at Dedham, Mass., in 1886. His publications include *The New England Conservatory Course in Sight-Singing* (3 vols.).

COLE, THOMAS (1801-48). An American landscape painter. He was born in Lancashire, England, February 1, 1801. He passed his early childhood in Ohio, in which State his father settled on coming to America. Cole possessed a temperament susceptible to the beautiful in nature; but his love for art was awakened by the portrait painter Stein, who, passing through the village, gave him some instruction in the rudiments of painting. After a few years of varied success at landscape work, Cole reached New York, where he received the encouragement of Durand and Trumbull. He visited and painted in many countries of Europe, but he preferred the scenery of America to that of the Old World. His picture of the "White Mountains" is in Wadsworth Gallery, Hartford. He is best remembered by his allegorical pictures of the "Voyage of Life." His style of painting, in spite of his industrious study of nature, remained to the last artificial. He employed it more for portraying allegorical themes than with any sincere desire to interpret Nature herself. The Metropolitan Museum of Art owns his work "In the Catskills." He died near Catskill, N. Y., February 11, 1848. Consult: Tuckerman, *Book of the Artists* (New York, 1827); Clement and Hutton, *Artists of the Nineteenth Century* (Boston, 1884); Hartmann, *History of American Art* (Boston, 1902, vol. i.).

COLE, TIMOTHY (1852-). An American wood-engraver, born in London. He came to the United States when very young, and in 1875 began to illustrate for the Century Publishing Company, in New York City. His first series of "Old Italian Masters" was finished in 1892. This was followed by the Dutch and Flemish series in 1896, and the English in 1900. The "Old Spanish Masters" was begun in 1902. By many critics Mr. Cole is considered the best of modern engravers. Several of the French en-

gravers may be his equals, or technically cleverer than he, but there is none whose work is more substantial. He is especially effective in his use of the white line and in reproducing textures; his results in general are produced by conservative methods, in the employment of which he has gained breadth and power and appreciation of light and of the personality of his subject. He gives the intimate qualities of each school, so that there is no mistaking one for another, and yet he retains his own individuality.

COLEBROOKE. See GRAND FALLS.

COLEBROOKE, HENRY THOMAS (1765-1837). An eminent English Orientalist. He was born in London, June 15, 1765. In 1782 he went out to India, and after serving in various civil capacities under the East India Company, was appointed professor of Sanskrit in the newly founded college at Fort William. Afterwards he became a judge at Mirzapur, and subsequently held the appointment of president of the Board of Revenue. During his residence in India he gained an extensive knowledge of the literature of the Vedas and of the Sanskrit grammarians, metaphysicians, and mathematicians. A sound critical judgment marks all his writings. He was a director of the Royal Asiatic Society of Bengal; and many of the most valuable essays in the *Asiatick Researches* were contributed by him. These, with other papers by him, were republished as his *Miscellaneous Essays*, in 2 vols. (1837). He likewise made translations from Sanskrit works on Hindu law, mathematics, religion, and philosophy, which have remained as important contributions to our knowledge of India (consult his *Miscellaneous Essays*, London, 1837; new ed., 1873). Colebrooke wrote a Sanskrit Grammar (1805), and contributed to Sanskrit lexicography by his edition of the *Amarakośa* (Serampur, 1808). After his return to England he was made director of the Royal Asiatic Society. He died in London.

COLEMAN, JOHN. An English actor and theatrical manager. He was born in the Midlands, and is said first to have been attracted to the stage when Macready was manager of Drury Lane. He himself won distinction as an actor, his best part, perhaps, being Henry V., but his career has been chiefly that of a manager. He was long the lessee of what was known as the Yorkshire Circuit, and brought out many well-known plays, among them *It's Never Too Late to Mend*, *Foul Play*, and *Put Yourself in His Place*. In London he has been lessee of the Olympic, the Queen's, and Drury Lane theatres. In 1897 he produced in Birmingham his own play of *Soggarth Aroon*, appearing himself in the title rôle.

COLEMAN, JOHN (1803-69). An American editor and clergyman of the Protestant Episcopal Church, born in Baltimore, Md. He was ordained priest in 1836, and from 1836 to 1856 was rector of Trinity Church, Philadelphia, Pa. For a time he was associated with the Rev. P. Ogilby in the editorship of the *Banner of the Cross*, published in Philadelphia. He prepared an edition (1840; with an introduction) of George S. Faber's *Difficulties of Romanism* (1826), and one (1840) of Dr. W. H. Wilmer's *Episcopal Manual* (1815; 2d ed., 1822).

COLEMAN, LEIGHTON (1837—). An American clergyman of the Protestant Episcopal

Church. He was born in Philadelphia, Pa., graduated in 1861 at the General Theological Seminary (New York City); took orders as deacon in 1860, and as priest in 1862, and from 1861 to 1879 was rector of churches successively at Bustleton, Pa., Wilmington, Del., Mauch Chunk, Pa., and Toledo, Ohio. After residence in England from 1879 to 1887, he was rector at Sayre, Pa., in 1887-88, and in the latter year was consecrated bishop of Delaware. His publications include *The Church in America* (1895); and *A History of the Church in the United States* (1901, in the Oxford Church Text series).

COLEMAN, LYMAN (1796-1882). An American educator and author, born at Middlefield, Mass. He graduated at Yale in 1817, was tutor there from 1820 to 1825, and later studied in Germany, and taught German at Princeton. From 1861 to 1868 he was professor of Greek and Latin at Lafayette College, and from 1868 until his death professor of the Latin language and literature. He published *Ancient Christianity* (1852); *Historical Text-Book and Atlas of Biblical Geography* (1854; revised, 1859); *Prelacy and Ritualism* (1869); and other works.

COLEMAN, WILLIAM TELL (1824-93). An American pioneer. He was born in Cynthiana, Harrison County, Ky., and was educated at Saint Louis University. In 1849 he went to California, and eventually settled in San Francisco, where he engaged in the shipping and commission business. After opening a branch in New York, he established a steamship line between that city and San Francisco in 1856. He was president of the vigilance committees (1851 and 1856) in San Francisco, and during the labor troubles of 1877 he again organized a force of several thousand men to preserve order. One of his most noteworthy achievements was the embellishment and extension of the town of San Rafael, Cal. See VIGILANCE COMMITTEES.

COLENSO, JOHN WILLIAM (1814-83). An English bishop, born in Saint Austell, Cornwall. He was educated at Cambridge, was fellow and tutor in Saint John's College; became rector of Forneett Saint Mary, in Norfolk, in 1846, and in 1853 was appointed first Anglican Bishop of Natal, South Africa. The first of his works that attracted especial attention was *A Translation of the Epistle to the Romans, Commented on from a Missionary Point of View* (1861). The *Pentateuch and Book of Joshua Critically Examined* (7 vols.), in which the authorship of Moses and the accuracy of many statements in the books were questioned, and the inspiration of the Old Testament denied, appeared in 1862-79. Colenso was deposed by his Metropolitan, the Bishop of Cape Town, but the deposition was declared void by the Privy Council. The trustees of the Colonial Bishops Fund then stopped his income, but the Court of Chancery ordered it to be paid, with arrears and interest. The see of Grahamstown was erected in place of that of Natal, in order to carry out the effect of the spiritual sentence without conflict with the State; and for the rest of his life Colenso occupied a schismatic position. He published also *Ten Weeks in Natal* (1855), and translated the Bible into the Zulu language. Consult Cox, *Life of Bishop Colenso* (London, 1888).

COLEOPTERA (Neo-Lat. nom. pl., from Gk. *κολέπτερος*, *kolépteros*, sheath-winged, from *κολέος*, *koléos*, sheath + *πτερόν*, *ptéron*, wing). An order of insects, comprising beetles, and characterized primarily by the possession of wing-covers. See BEETLE.

COLEPEPER, kól'pép-ēr, JOHN, Lord (?-1660). An English politician, prominent as a supporter of the Stuart Kings against the Parliament. He was born at Wigsell, in Sussex, and after travelling abroad began to play an active part in county politics. In 1640 he became a member of the Long Parliament, and, a zealous adherent, at first, of the popular party, gradually passed over to the side of the King, who, in 1642, made him Chancellor of the Exchequer. With Falkland and Hyde, he played an important part in the negotiations between King and Parliament, preceding the outbreak of hostilities. He fought in the battle of Edgehill (October 23, 1642), and in January of the following year was made master of the rolls, leaving the Chancellorship to Hyde, of whose influence he was exceedingly jealous. On the downfall of the Royalist fortunes in 1645, Charles I. intrusted Colepeper with the care of the person of the Prince of Wales, with whom in the following year he went to France. Later he lived with Prince Charles in the Netherlands and remained one of his principal advisers, going in his behalf on a mission to Russia (1650) and accompanying him to the peace congress of the Pyrenees in 1659. He returned to England after the Restoration, but died soon after. Colepeper was one of the ablest debaters and politicians of his time in England, but his influence suffered from a certain lack of confidence in his own opinions. He was given, too, to violent outbursts of temper.

COLEPEPPER, kól'pép-ēr, Captain JOHN. A bully and murderer, nicknamed 'Poppercul,' in Scott's *Fortunes of Nigel*, who is killed in a fight in Enfield Chase by Richie Moniplies, just after the murder of Lord Dalgarno.

COLER, ALWIN GUSTAV EDMUND VON (1831—). A German physician, born in Groningen. He studied medicine in Berlin, entered the Prussian Army in 1856, was made surgeon-general in 1874, and head surgeon of the general staff in 1889. General Coler's activity resulted in improvements of the highest importance in army hygiene, reforms in the military hospital service, the establishment of corps of sanitary officers, and the introduction of antiseptics into military surgical practice. He was also largely instrumental in formulating medical regulations for the German Army, which have since been adopted by the armies of all civilized nations. In 1892 he was made professor at the University of Berlin. He wrote, jointly with Langenbeck and Werner, *Die transportable Lazarettbaracke* (1890).

COLER, BIRD SIM (1868—). An American politician, born in Illinois. He established himself as a stock-broker in New York City, became prominent in municipal and State politics, and served as first Comptroller of Greater New York during the administration of Robert Van Wyck as Mayor. In 1902 he was the Democratic nominee for Governor of New York, but was defeated by a small plurality in spite of the enormous vote cast for him in the city of New York. He published *Municipal Government* (1900).

COLERAINE, kól-rān'. A Parliamentary and municipal borough and seaport, in the county of Londonderry, Ireland, on the Bann, four miles from the sea, and 47 miles north-northwest of Belfast, with which it is connected by railway (Map: Ireland, E 1). It consists of a central square and several diverging streets. The town has considerable manufactures of soap, linen, paper, and leather, and its port is accessible to ships of 200 tons. Population, 6800.

COLERIDGE, ERNEST HARTLEY (1846—). An English author, grandson of Samuel Taylor Coleridge. He was graduated from Balliol College, Oxford, in 1870; served as tutor from 1872 to 1893, and became secretary to the Lord Chief Justice of England in 1894. He edited *Letters of S. T. Coleridge* (1895); *Anima Poeta*, selections from note-books of Coleridge (1895), and *Poetical Works of Byron* (1898-1901); and published a volume of graceful poems (1898).

COLERIDGE, HARTLEY (1796-1849). An English poet, born at Clevedon, Somersetshire, the eldest son of S. T. Coleridge. He studied at Oxford, and was elected to a fellowship at Oriel College, from which he was removed by the authorities in 1826 on the charge of intemperance. For two years he resided in London. Then he returned to the Lake Country, and after having twice attempted school-teaching, first privately at Amble-side, and later at the grammar school of Sedbergh as an assistant in 1837 and 1838, settled at Grasmere. An almost constant wanderer about the vales, this diminutive figure, prematurely gray and old, became familiar to the peasantry as 'Little Hartley.' He was a scholar of rare attainment, a poet of exquisite taste and easy felicity, to whom, in the words of Dowden, "good thoughts came as of free grace." But lacking will and the capacity for sustained application, he remained despondent, fragmentary, ineffectual. His longest literary work was in the preparation of an edition of the dramas of Massinger and Ford, with biographies of those authors (1840). He also wrote a series of lives of the Worthies of *Yorkshire and Lancashire* (1836; originally as *Biographia Borealis*, 1833). He is best known, however, for his verse, which, if it distinctly lacks as to power, is singularly fine in mood and happy in expression. Of the sonnet, a form, as Dr. Garnett observes, "which precisely suited both his strength and his limitations," he composed some of the finest examples in English. Such are "Whither," "To Shakespeare," "Prayer," "May, 1840," "Regrets," and "Ideality." His brother, Derwent, edited four volumes of his literary remains (two volumes of poetry and two of prose, London, 1851). Selections are to be found in all important anthologies. Hartley Coleridge was, his life long, a friend of Wordsworth, whose "To H. C.: Six Years Old," seems strangely prophetic.

COLERIDGE, HENRY NELSON (1798-43). An English man of letters, nephew of Samuel Taylor Coleridge. He was born at Ottery Saint Mary, Devonshire; graduated at Cambridge, and studied law. Soon afterwards he made a trip to the Barbados, which he describes in *Six Months in the West Indies* (1825). In 1829 he married his cousin, Sara Coleridge. He was his uncle's literary executor, and prepared the second edition of the latter's political and dramatic works (London, 1834). He edited *Literary Re-*

mains (London, 1836-39); *Confessions of an Inquiring Spirit* (ib. 1840, with notes by Sara Coleridge, 1849); and published *Table Talk* (1835), notes which he had collected during several successive years, and gathered into a volume. His son, HERBERT COLERIDGE (1830-61), born at Hampstead, was a philologist. He was appointed secretary of a special committee of the Philological Society for the purpose of collecting material for a new English dictionary. This was the origin of the dictionary published by the Clarendon Press, under the editorship of Dr. J. A. H. Murray.

COLERIDGE, JOHN DUKE, Baron (1820-94). An English jurist, nephew of Samuel Taylor Coleridge. He was born in London; graduated at Oxford in 1842; was called to the bar in 1846, and soon became prominent in his profession. He was a member of the House of Commons from 1865 to 1873; was knighted in 1868, became Attorney-General in 1871, was appointed Chief Justice of the Court of Common Pleas in 1873, and in the same year was raised to the peerage as Baron Coleridge of Ottery Saint Mary. On the death of Sir Alexander Cockburn in 1880, he succeeded him as Lord Chief Justice of England. In 1883 he visited the United States and was cordially received, especially by the bench and bar.

COLERIDGE, SIR JOHN TAYLOR (1790-1876). An English judge and author, a nephew of Samuel Taylor Coleridge. He was born at Tiverton; graduated at Oxford in 1812, was called to the bar in 1819, and was made a judge of the King's Bench in 1835 and a Privy Councillor in 1858. On the retirement of Gifford in 1834, he became for a short period editor of the *Quarterly Review*. He published an annotated edition of *Blaekstone's Commentaries* (1825), and a *Life of Keble* (1869). He was a friend of the latter, as well as of Wordsworth, Pusey, and Newman.

COLERIDGE, SAMUEL TAYLOR (1772-1834). An English poet, philosopher, and critic. He was born at Ottery Saint Mary, Devonshire, and educated at Christ's Hospital, where Charles Lamb was a school-fellow. He was an omnivorous reader, even as a boy, and gaining access to a library through a chance acquaintance, he read "right through the catalogue." He soon gained a remarkable knowledge of Greek, and before he was fifteen plunged boldly into the sea of metaphysics. The sonnets of W. L. Bowles, which fell into his hands at this time, gave him his first impulse toward poetry. In 1791 he entered Jesus College, Cambridge. At the university his whole mind was given to classics, and he obtained a prize for a Greek ode. During his second year there, in a fit of despondency, he went up to London and enlisted in the Fifteenth Dragoons, under the name of Silas Tomkyn Comberback, or Cumberbatch—remaining faithful to the initials S. T. C., which were afterwards to be so familiar among the readers of his period. His identity was discovered through an accident, and his friends intervened to procure his discharge. He returned to Cambridge in 1794, but never took a degree. During a visit to Oxford he became acquainted with Southey, and in the same year, after a trip through Wales, visited him at Bristol. The two young men and some of their friends now formed a scheme for emigrating to the United States, where, on the banks of the Susquehanna (the melody of the name seems to

have been one of the inducements), they were to found a colony where the laws of equality and fraternity were to prevail, and the Golden Age was to be ushered in. They, with Wordsworth and other generous youths of the time, were deeply impressed with the proclamation of liberal principles in the French Revolution, though they afterwards drew back, alarmed by its excesses, some into extreme Toryism. The establishment of their ideal 'Pantisocracy' was delayed by the lack of capital; and a year or two later the dream faded away.

At Bristol, Coleridge became acquainted with his future wife, Sara Fricker, to whose sister Southey was engaged. Joseph Cottle, a bookseller in Bristol, had offered Coleridge thirty guineas for a volume of his poems, and promised him a guinea and a half for every hundred lines he should write after finishing it. On this prospect he married in October, 1795, and settled in a cottage at Clevedon. After many delays, his volume of *Juvenile Poems* appeared in April, 1796. His earlier work is all in the stereotyped style of the eighteenth century, and shows little trace of the powers which were to make him famous. In the early part of 1796 he began the publication of a weekly review, the *Watchman*, devoted to literature and politics, but met with little success and abandoned the undertaking after the tenth issue. In the winter of 1796 he settled at Nether Stowey, near Bridgewater, whither Wordsworth removed in the following year. He was freed from the material cares of life by the generosity of Charles Lloyd, the son of a Birmingham banker, who had become a devoted disciple of Coleridge, and Thomas Poole, who conferred on him a small annuity. At Nether Stowey, inspired perhaps partly by the beautiful scenery, and still more by the strengthening companionship of his friend, he composed his finest poems, including the "Ancient Mariner," and the first part of "Christabel," and "Kubla Khan," though the two latter were not published until eighteen years afterwards. The two authors had many discussions on the principles of their art, which resulted in the publication, in 1798, of their epoch-making *Lyrical Ballads*. This little book, published anonymously, though a total failure at the time, was decisive in its influence on the future of nineteenth-century poetry, freeing it finally from the conventional trammels which had long bound it. The work of the two poets is singularly complementary, Coleridge treating supernatural subjects in such a way as to give a strong impression of their reality, while Wordsworth so handled the simplest themes as to disclose unsuspected elements of mystery and awe. Coleridge's contribution to the *Ballads* comprised the *Ancient Mariner*, the *Nightingale*, and two scenes from his play *Osorio*. In the edition of 1800 there was added *Introduction to the Tale of the Dark Ladie*.

Coleridge, who had become a Unitarian at Cambridge, preached frequently during this period in the chapels of that body, and had thoughts of becoming a regular minister. To deliver him from this necessity, two brothers named Wedgwood settled on him an annuity of £150, and this enabled him to carry out the long-cherished plan of going to Germany to study. In September, 1798, he sailed for Hamburg with Wordsworth, and after acquiring the language went to Göttingen, remaining, in all,

nearly a year. This was a period of vast importance in his development, and he said himself that there was no time of his life to which he looked back with such unmingled satisfaction. He came under the influence of what Shairp calls "an impulse, the most original, the most far-reaching, and the most profound which Europe has seen since the Reformation." The first result of his new knowledge of German thought was not in philosophy, but in poetry; on his return to England he published his noble translation of Schiller's *Wallenstein*. He also contributed fitfully to the *Morning Post*, to the end of 1802. Before that time, however, he had settled at Greta Hall, Keswick, in the Lake district, attracted by the proximity of Wordsworth and Southey, who were to share with him the designation of Lake Poets, given in derision by the *Edinburgh Review*. Here, in 1800, he wrote the second part of "Christabel." Driven from the north by rheumatism in 1804, he went to the Mediterranean, acting for some months as secretary to the Governor of Malta, and spending several more at Rome.

On his return to England, he delivered some lectures on poetry and the fine arts at the Royal Institution, London, and began the publication of *The Friend*, a periodical which contained too much abstruse philosophy to be popular, and lived less than a year. During part of 1811 he was connected with the *Courier*, contributing articles of a general political nature. In 1813 his play *Remorse* was successfully produced at the Drury Lane Theatre and helped to relieve his distressed financial condition. His enslavement to opium, which he had begun to take as a relief from his rheumatic pains, was now increasing, and in De Quincey's opinion "killed him as a poet." His constitutional indolence and dislike for steady application completed his unfitness for meeting the demands of life. Roving between London and the Lakes, where his family was generally under Southey's care, he spent a number of baffled and disappointed years.

From 1816 until his death, July 25, 1834, he lived in the house of Mr. Gillman, at Highgate in London, where he received the kindest and most judicious care, and at least to some extent mastered his craving for opium. Though he projected far more than his habits ever allowed him to accomplish, he left as the result of those years no inconsiderable bulk of critical and philosophic writing; the *Biographia Literaria* (1817) is especially noteworthy. It was, however, as a talker, discoursing with an inexhaustible flow of ideas to admiring visitors, that he shone most brilliantly in his latter years. Talk was his best medium for showing himself to others. His style in prose writing was cumbersome and his matter involved. In reading his written work of this class, we feel instinctively that the critic was greater than the criticism.

No man had ever appeared in England who united in so eminent a degree the three functions of critic, philosopher, and poet. With all his defects, Coleridge must be recognized as being, in Mill's phrase, the greatest "seminal mind" of his time. The present generation does not realize how much it owes to him in many fields of thought—how many impulses, still powerful, he set in motion. In criticism, he was the father of modern Shakespearean study, laying, in a few pregnant sentences, a broad basis for criticism, in contrast to the narrow canons of Johnson and the eighteenth-century school. His *Aids to Re-*

flection and some of his other theological writing inspired Maurice and Stanley and the 'Broad-Church Movement' as a whole. His aphorisms are often decisive—it is to him we owe what are now commonplaces, the distinction between genius and talent, fancy and imagination, wit and humor. Detached phrases of his are still upon the lips of many who do not remember their source—like "Every man is born either an Aristotelian or a Platonist," or "Prose is words in their best order; poetry is the best words in the best order." In philosophy, originally a fervent disciple of Hartley (q.v.), who had been a member of his own college, he passed on through the theories of Berkeley and Leibnitz; and, after falling under the influence of the German and other mystics, came to a point where, he says, the works of Kant took hold of him as with a giant's hand. He adopted and based all his teachings on Kant's distinction between the Understanding and the Reason; and while he has not as a philosopher left any complete system, yet he rendered excellent service by his insistence, in such a period as his, on the reality and preëminence of the spiritual verities. His introduction into England of German literature and philosophy, so powerfully seconded by Carlyle, is alone enough to give him a high place among the forces that determined the course of nineteenth-century thought among English-speaking people. But it is as a poet that he must hold the highest rank, though no other poet has ever attained such a place on so small a volume of first-class work. "Christabel," "The Rime of the Ancient Mariner," and "Kubla Khan" (which so good a judge as Swinburne has called "for absolute melody and splendor the first poem in the language") cannot be put in any but the highest class. Moreover, his influence on his successors must be taken into account. The Pre-Raphaelite Movement, which Theodore Watts-Dunton defines as "the Renaissance of the Spirit of Wonder in poetry and art," owes more to him than to any other English poet. One can only regret that so much was wasted of the greatest powers which for generations had been granted to any Englishman.

Consult: the *Complete Works*, ed. by Shedd (7 vols., New York, 1884); his *Poetical Works*, ed. by Campbell (London, 1893); *Poems*, a facsimile reproduction of the proof and MSS. of some of the poems, ed. Campbell (London, 1899); *Lyrical Ballads*, centenary edition by Hutchinson (London, 1898); *Anima Poetae*, from his unpublished note-books by his grandson (London, 1895); lives by Gillman (London, 1838), Traill ("English Men of Letters" series, London, 1884), Dykes (London, 1894), and Hall Caine (London, 1887); Cottle, *Early Recollections* (London, 1837); Brandl, *Samuel Taylor Coleridge und die englische Romantik* (Berlin, 1886; English translation by Lady Eastlake, London, 1887); and a thorough and luminous discussion in Shairp, *Studies in Poetry and Philosophy* (Edinburgh, 1868). Consult also: E. H. Coleridge, *Letters of Samuel Taylor Coleridge* (London, 1895); and Beers, *English Romanticism in the Nineteenth Century* (New York, 1900).

COLERIDGE, SARÁ (1802-52). An English author, born at Greta Hall, near Keswick. She was the only daughter of Samuel Taylor Coleridge, and married her cousin, Henry Nelson Coleridge (1829). The early part of her life was spent with her uncle, Robert Southey. After

the death of her husband she continued the editing of her father's works, and this was her principal literary work. Her intelligence and learning are shown in various translations and some original work, of which the tale *Phantasmion* (1837) is the most important. Consult her *Memoirs and Letters*, edited by her daughter (London, 1873).

COLERIDGE-TAYLOR, SAMUEL (1875—). An English composer of music, born in London. He is of African descent, through his father, who was a native of the West Coast of Africa (Sierra Leone). His mother was an English-woman, and he himself was brought up under English influences. After a distinguished career at the Royal Academy—which he entered at fifteen, winning the composition scholarship in 1893, and studying under Villiers-Stanford until 1896—he devoted himself entirely to composition. Up to 1902 his best work was a musical setting to Longfellow's *Hiawatha*, arranged for soprano, alto, and baritone soloists and mixed chorus. His other published and manuscript works include an idyll for orchestra; a ballade for violin and orchestra; a symphony in A minor (1896); an operetta, *Dream Lovers*; and several songs and anthems.

COLES, KÖLZ, COWPER PHIPPS (1819-70). An English naval officer. He served as flag-lieutenant to Sir Edmund Lyons in the Mediterranean (1853), and at the bombardment of Sebastopol (October 17, 1854). In 1856 the plan of defensive armor for battle-ships began to engage his attention. The idea originally proposed had been that of a raft and shield, and this idea was modified by Coles into that of a vessel with a low freeboard surmounted by a series of turrets equipped with heavy guns. The similarity of this conception to the monitor type elaborated by Ericsson was such that the respective claims of the two men eventually led to a bitter controversy. A vessel was finally constructed in accordance with Coles's specifications. She was commissioned under the name of *The Captain*, in 1870, and on September 7 of that year capsized in a gale off Cape Finisterre, and almost everybody on board, including Coles, was drowned.

COL'ET, JOHN (c.1467-1519). An English theologian, born probably in 1467 in London. He studied at Oxford, traveled in Paris and Italy (1493-96), and became acquainted with Budæus and Erasmus. Returning to England, he took up his residence at Oxford, and there lectured upon the Epistle to the Romans, displaying originality and independence of the schoolmen. The next year he lectured in the same fashion on First Corinthians, and so upon other New Testament books, until, in 1505, he was appointed dean of Saint Paul's, London. Having inherited from his father a large fortune in 1509, he founded Saint Paul's School in London, of which William Lilly was the first master. His religious opinions were so much more liberal than was common at the time that he was subjected to considerable persecution. As dean of Saint Paul's he made a great point of expounding the Bible, disapproved of auricular confession and the enforced celibacy of the clergy, denied the efficacy of pilgrimages and the worship of images, and denounced corruption in the Church. His influence is traceable as paving the way for

the Reformation, although it is probable that, like other humanists, he would not have left the old Church. He died in London (or at Sheen, a few miles southeast of London), September 16, 1519. Aside from his *Latin Grammar* and his *Daily Devotions*, his works did not appear until the nineteenth century, edited by Rev. J. H. Lupton, with English translations. Consult his biography by J. H. Lupton (London, 1887); and F. Seebohm, *Three Oxford Reformers: Erasmus, Colet, and More* (3d ed., London, 1887).

COLET, KŌLÁ', LOUISE RÉVOIL (1810-76). A French poet and novelist. Among her verses are *Les fleurs du midi* and *Penserosa*. The *Musée de Versailles* and *Les funérailles de Napoléon* are more sustained flights, the former crowned by the Institute. A comedy, *La jeunesse de Goethe* (1839), and two novels, *La jeunesse de Mirabeau* (1841) and *Les cœurs brisés* (1843), deserve mention, but nothing that she composed equals in interest her publication, in defiance of a legal injunction, of the correspondence of Madame Récamier with Benjamin Constant (1849).

COLEWORT (from *cole*, AS. *cāwel*, *cānl*, OHG. *kōl*, Ger. *Kohl*, cabbage, from Lat. *caulis*, cabbage, Gk. *καυλός*, *kaulos*, stalk + *wort*, AS. *wyrt*, plant, Ger. *Wurzt*, root; ultimately connected with Lat. *radix*, root). A name given to some of the many cultivated varieties of Brassica oleracea, and applied, like the names borecole and kale, to varieties differing from the cabbage (q.v.) in their open heads of leaves, which are used as greens, especially in the winter months. The same name is also given to cabbages cut for use before their leaves have fully closed into heads.

COLFAX, KŌL'fäks. A city and county-seat of Whitman County, Wash., 78 miles south of Spokane; on the Palouse River, and on the line of the Oregon Railroad and Navigation Company (Map: Washington, II 3). The centre of a fertile agricultural country, it controls a considerable trade in live stock, grain, fruits, and lumber. There are also several industrial establishments. The city owns its water-works. Population, in 1890, 1649; in 1900, 2121.

COLFAX, SCHUYLER (1823-85). An American statesman, born in New York City. He removed to Indiana in 1836, where he studied law, and in 1845 became editor of the *Register*, a Whig newspaper at South Bend, which, under his management, became the most powerful organ of its kind in that part of the State. After a defeat in 1851, he was elected to Congress in 1854, served seven consecutive terms, and was Speaker from 1863 to 1869. He was Vice-President of the United States from 1869 to 1873. In the John C. Frémont campaign of 1856, a speech made by him was used for party purposes, and half a million copies were distributed over the country. He introduced several important acts for the reform of the postal system, in which he took an especial interest, and in 1862 framed the law which made fraudulent contractors felons. Charges of corruption were brought against him at the time of the Crédit Mobilier scandal (q.v.), in 1873, but were never proved. Consult Hollister, *Life of Schuyler Colfax* (New York, 1886).

COLGATE, KŌL'gát, JAMES BOORMAN (1818—). An American financier. He was born in

New York City, and received his first commercial training in the house of Boorman, Johnston & Co. He later established the banking house of Trevor & Colgate, afterwards known as J. B. Colgate & Co. His extensive loans to the Government and sound financial policy during the financial crisis of 1873 contributed materially to the reestablishment of confidence both in the United States and in the markets of Europe. He was one of the founders of the New York Gold Exchange, and was for several years its president. As trustee and president of Colgate (formerly Madison) University, he for thirty years made almost annual donations to that institution, the development of which is due chiefly to his constant care and valuable advice.

COLGATE, SAMUEL (1822-97). An American manufacturer and philanthropist, born in New York City. He became widely known as a soap-maker, and the manufactory he built in Jersey City has developed into one of the largest establishments of the kind in the world. He was also prominent in philanthropical work. For more than thirty years he was trustee of Colgate University, and for many years he was president of the New York Baptist Education Society, president of the Society for the Suppression of Vice, and a member of the Executive Committee of the American Baptist Missionary Union and of the American Tract Society. One of his most noteworthy achievements was the collection of 30,000 volumes of reports (now in the Colgate University Library), comprising the documentary records of the Baptist denomination. Conjointly with his brother, James B. Colgate, he gave large sums to Colgate (formerly Madison) University, which in 1889 was named in honor of the Colgate family.

COLGATE UNIVERSITY. An institution of higher education, situated at Hamilton, N. Y. It was founded by the Baptist Education Society in 1818, for the education of Christian ministers. The collegiate and preparatory departments were incorporated in 1846, under the name of Madison University, leaving the management of the theological department with the Baptist Education Society. Under the administration of President Ebenezer Dodge (1868-90), the endowment fund of the college increased from \$150,000 to \$500,000. In 1890 the name of the institution was changed to Colgate University, in honor of William Colgate and his sons, who established the 'Dodge Memorial Fund' of \$1,000,000. In 1893 Hamilton Theological Seminary—since 1846 under the control of the Baptist Education Society—became part of Colgate University. The attendance, including the theological department, is about 220. The elective system has been introduced in the senior year, and largely in the junior year. The library numbers about 35,000 volumes, besides the famous Baptist Historical Collection, the gift of Samuel Colgate. Colgate Academy, originally a part of the institution, is now located in a separate building, but forms an integral part of the corporation. Colgate University offers courses leading to the bachelor's and master's degrees in arts, philosophy, and science, and to the bachelor's degree in divinity. It offers also courses in education which enable students to obtain college graduates' professional certificates. The university endowments amount to over \$1,600,000, and the total value of the university property to \$2,160,000.

COLIC (from OF., Fr. *colique*, ML. *colica*, colic, from Gk. *κολικῆ*, *kōlikē*, colic, from *κῶλον*, *kōlon*, colon). A name employed by physicians to denote severe pain of the abdomen, spasmodic in character and dependent upon irregular contraction of the muscular coat of the intestines. Intestinal colic is a symptom of neuralgia of the intestines, caused by cold; of mild enteritis, caused by irritating food or purgative medicine; of toxic conditions such as lead poisoning, poisoning by the bacterial toxins of shell-fish, etc.; of peritonitis, appendicitis, and other diseases. If warmth, an aperient (such as castor-oil), or peppermint, or tincture of ginger, fails to give relief, a physician should be summoned. Renal colic is pain over the kidney and through the abdominal wall, due to passage of a calculus, or stone, from the kidney through the ureter into the urinary bladder. Hepatic colic is the pain caused by the passage of a gall-stone from the gall-bladder into the intestines.

COLIC IN ANIMALS. A disease most frequently occurring in horses and mules. It assumes several forms, such as spasmodic, flatulent, and habitual. Spasmodic or cramp colic is caused by spasm of the small intestines and is due to the presence of foreign bodies in the intestines, to large draughts of cold water, to exposure to cold, or to hard work too soon after eating. It is most frequent in high-bred horses. This form of colic always begins suddenly. The horse looks backward, shows acute pain, paws, lies down and gets up frequently. As the pain becomes more intense the animal throws himself down with great violence and strikes with the feet. These spasms are interrupted by intervals of quiet, but the intervals become shorter and shorter. This form of colic ordinarily yields promptly to appropriate treatment. Perhaps the best remedy is one ounce of chloral hydrate in a pint of water given as a drench. Cannabis indica gives good results, as also ether and laudanum. Flatulent colic is sometimes used as synonymous with bloat (q.v.). Baking-soda in doses of two to four ounces is a good remedy. Any alkaline substance neutralizes the acid fermentation and should be administered at once. In severe cases the bowels may be punctured at the most distended part by means of a trochar and canula. Enemas of lukewarm water, to which a little soap has been added, are useful in both forms of colic, as are also cathartics, such as aloes in full doses.

COLIGNY, kō'l'nyé', or COLIGNI, GASPARD DE (1517-72). An Admiral of France and Huguenot leader, born at Châtillon-sur-Loing, February 16, 1517. He came of a noble family, his father having been Marshal Gaspard de Coligny, his mother Louise de Montmorency. He was introduced at Court at the age of twenty-two and served under Francis I. in Italy, where he evinced great bravery, especially at the battle of Ceresole (1544). Under Henry II. he was made colonel-general of the infantry, and in 1552 he became Admiral of France. In all the wars in which he took part he showed himself a born general and leader. On the death of Henry II., 1559, Coligny, who had previously adopted the Reformed faith, became, with the Prince of Condé, one of the great leaders of the Huguenots. In this capacity he was remarkable alike for his

prudence and his bravery. Opposed to the Huguenot chiefs was the powerful Catholic party headed by the Duke of Guise and the Constable de Montmorency. At the disastrous battles of Dreux (1562) and Jarnac (1569), Coligny's skill saved the remnants of the Protestant army. Condé was slain on the field of Jarnac and Coligny assumed the sole leadership until he gave way to the young Prince of Navarre. (See HENRY IV.) Together they besieged Poitiers, but the Huguenot forces were again routed on the bloody field of Moncontour (October 3, 1569). When peace was concluded in 1570, Coligny went to Court, and was apparently well received by Charles IX., but the enmity of the Catholic party, by whom Coligny was unjustly accused of having murdered the Duke of Guise at the siege of Orléans, was stirred up against him, and an attempt was made to assassinate him on the street, August 22, 1572. This was but preliminary to the general massacre of Huguenots which took place two days afterwards and in which Coligny perished. While upholding the Huguenot cause at home Coligny exerted himself to secure a safe asylum for his coreligionists in the New World, and sent repeatedly expeditions (Ribault in 1562, Laudonnière in 1564) to colonize what is now the southeastern part of the United States. Among his papers, burned by order of Catherine de' Medici, was his *History of the Wars of Religion in France*. Consult: Tessier, *L'Amiral Coligny* (Paris, 1872); Delaborde, *Gaspard de Coligny* (3 vols., Paris, 1879-82); Bersier, *The Early Life of Coligny* (translation by Annie H. Holmden, London, 1884); Blackburn, *Life of Coligny* (Philadelphia, 1869); Besant, *Life of Coligny* (London, 1892).

COLIMA, kô-lé-má. The capital of the State of the same name, Mexico, on the Colima River, about 40 miles from the Pacific Coast (Map: Mexico, G 8). It is situated at an altitude of 1400 feet, is generally well built, and has fine plazas and a number of pretentious buildings, among which are the Government building and town hall, the Hospital de San Juan, and the market. The town has connections by rail and water with the port, Manzanillo, and is the seat of considerable trade. Colima was founded in 1522 by Gonzalo de Sandoval. Population, in 1895, 18,977. About 40 miles to the northeast of the town, in the State of Jalisco, is the volcano of Colima (nearly 13,000 feet), which has recently been in a state of eruption.

COLIN CLOUT. (1) A poetical satire on the clergy by John Skelton. (2) The *non-de-plume* adopted by Spenser, suggested by the above. (3) A shepherd in Gay's pastoral *The Shepherd's Week*.

COLIN CLOUT'S COME HOME AGAIN. A pastoral poem by Edmund Spenser, and dedicated to Sir Walter Raleigh, in a letter dated Kilkolman, December 27, '1591' (probably 1595). In it he thanks that knight for sundry "favours and good turnes done to me at my late being in England."

COLINS, ALEXANDER (1526-1612). A Flemish sculptor, born at Mechlin. In 1563, at the summons of Emperor Ferdinand I., he went to Innsbruck, where he executed twenty reliefs on the tomb of Maximilian, in the Hofkirche. Subsequently he was appointed Court sculptor to the Emperor. Among his other works is the fine

monument to the Archduke Ferdinand of Tyrol, in the Silver Chapel of the Hofkirche. Consult the monograph, by von Schönleber, in vol. ii. (Heidelberg, 1889) of the *Mitteilungen zur Geschichte des Heidelberger Schlosses*.

COL'ISE'UM. See AMPHITHEATRE.

COLL, kôl. One of the Inner Hebrides, or western isles of Scotland, situated northwest of the island of Mull, Argyllshire. It is 14 miles long from northeast to southwest, with an average breadth of two and a half miles (Map: Scotland, B 3). More than a third of it is cultivated, or in pasture. The isle is low and rocky, and composed of gneiss. Population, 600, engaged in agriculture and fishing.

COLLAB'ORA'TION (Fr., from Lat. *collaborare*, to work together, from *con-*, together + *laborare*, to labor, from *labor*, work). The united labor of two or more persons on a literary production, as in the arrangement of a drama, or the compilation of a book requiring knowledge from different sources. Thus, Charles Reade and Dion Boucicault wrote *Foul Play*; Charles Dudley Warner and Mark Twain, *The Gilded Age*. Walter Besant and James Rice also long worked in collaboration upon numerous novels. The collaboration of Messrs. Ereckmann and Chatrian (q.v.), in French, produced many delightful works. Perhaps most famous of all is the literary partnership of Beaumont and Fletcher (q.v.).

COL'LAMER, JACOB (1792-1865). An American lawyer and politician, born in Troy, N. Y. He removed when very young to Vermont, graduated at the University of that State in 1810, was admitted to the bar in 1812, and soon became one of the leading lawyers of the State. From 1833 to 1841 he was associate justice of the State Supreme Court. He was a member of Congress from 1842 to 1848, and in President Taylor's Cabinet was Postmaster-General, which position, however, he resigned on the death of the President. In 1850 he was elected judge of the Supreme Court of Vermont, and four years later was elected to the United States Senate, where he was chairman of committees on post-offices, post-roads, and the library. He remained in the Senate until his death.

COLLAR (OF. *coler*, *colier*, Fr. *collier*, from Lat. *collare*, collar, from *collum*, neck; ultimately connected with AS. *heals*, with OHG. *hals*, Ger. *Hals*, neck). A band around a column or other architectural member; the necking of the capital in the Doric, Ionic, and Tuscan orders.

COLLAR-BONE. See CLAVICLE.

COLLARCO, kôl-lâr'kô (It., with the bow). In music, a term signifying that the notes over which it is placed are to be performed with the bow, in contradistinction to *pizzicato* (q.v.).

COLLARED LIZARD. One of a genus (*Crotaphytus*) of iguanid lizards, characteristic of the dry, open regions of the southwestern United States. They are often called 'collared' or 'ring-necked' lizards, because of the double black collar around the wrinkled neck of the common Texan species (*Crotaphytus collaris*). This species is found from the Ozark Mountains to Nevada and southern California, and is entirely insectivorous. In the deserts of the Colorado Valley there lives a second species, called 'leopard lizard,' which is larger, has no collar, and

its noted for its fierce and greedy disposition. It eats not only blossoms, leaves, and insects, but also young horned toads, and all sorts of smaller lizards, killing and swallowing some two-thirds



HEAD OF COLLARED LIZARD, SLIGHTLY ENLARGED.

of its own size. It will even kill and devour smaller individuals of its own species. This lizard is remarkable for the fact that not the male, as is usual among lizards, but the female, undergoes a change of color in the breeding season (mid-summer), becoming salmon-red on the whole abdominal region. Consult Merriam and Stejneger, *Death Valley Expedition* (Department of Agriculture, Washington, 1893).

COLLATERAL (Fr. *collatéral*, It. *collaterale*, from ML. *collateralis*, collateral, from ML. *con-*, together + *lateralis*, relating to a side, from *latus*, side). In law, supplemental or related to the principal thing in consideration, especially: (a) Given by way of security in addition to a principal obligation. (b) Descended from a common ancestor but not from one another—a sense used to describe the character of relationship of individuals for legal purposes.

Collateral Security is either: (a) Something of intrinsic value actually delivered over and pledged to the creditor, the value of which is to be applied on the debt in case of default; or (b) an additional obligation, given to guarantee performance of a debt or duty. The term is more frequently used to designate a pledge of stocks, bonds, negotiable paper, or other evidences of obligation, as distinguished from a pledge of chattels. The practice in case of a default is for the creditor, upon notice to the debtor, to sell the securities and apply the amount received therefrom toward the satisfaction of his claim and charge the debtor with the deficiency, or credit him with the surplus, if any. See MORTGAGE; PLEDGE; FORECLOSURE; and consult the authorities cited under PLEDGE.

Collateral Relatives, more frequently spoken of as 'collaterals,' are those who are descended from the same common ancestor, but not from one another, as lineal descendants are. Thus, an uncle is a collateral relative of a nephew, both being descended from a common ancestor, but the nephew not being a lineal descendant of the uncle. The term includes those in the relationship of brothers and sisters, aunts and uncles, nephews and nieces, and cousins. Collateral relatives are included in the term heir, real property descending in the first instance to lineal descendants, if any, and then to collaterals in the order of their relationship or as prescribed by statutes. See CONSANGUINITY; DESCENDANT; HEIR; LINEAL; DECEDENT; and consult the authorities referred to under DESCENT, etc.

COLLATERAL INHERITANCE TAX. See INHERITANCE TAX.

COLLATERAL WARRANTY. See WARRANTY.

COLLATION (OF. *collacion*, from Lat. *collatio*, collection, from *con-*, together + *latus*,

borne, connected with *tolerare*, Gk. *τλῆναι*, *tlēnai*, OHG. *dulten*, Ger. *dulden*, to endure). In law, a collecting or bringing together of all the assets of an estate into one common fund for distribution among the heirs or next of kin; a term more particularly used where heirs who have received property from the deceased ancestor by way of advancement return it to the estate in order that a more equitable division of the whole may be made. The term is used in the civil law, and in England it is called *hotchpot* (q.v.). The term is not in general use in the United States, but the law in most States provides that advancements made to an heir shall be considered as a part of the decedent's estate in order to determine whether such heir shall receive anything further. See ADVANCEMENT.

In English ecclesiastical law the term *collation* is used to denote the presentation of a clergyman to a benefice by the patron and bishop. See BENEFICE.

In maritime law *collation* is used in the sense of contribution or average (q.v.).

COLLATION OF MANUSCRIPTS. See BIBLE, *Textual Criticism*.

COLLÉ, kōl'lā', CHARLES (1709-83). A French dramatic author and song-writer, born in Paris. He became the secretary of the Duke of Orleans, the grandfather of Louis Philippe, and wrote plays for the theatre of the Palais Royal, and for the Comédie Française, of which several are still produced. 'Soldat de fortune dans les lettres,' as he has been called, he declined to become a member of the Academy, though his songs have made him famous in French literature. His plays have been collected under the title *Théâtre de société*, and his verses as *Les chansons de Collé*. His interesting *Journal historique* was edited by Barbier (Paris, 1807), and his *Correspondance inédite* by Bonhomme (Paris, 1864).

COLLE, kōl'lā', RAFFAELLO DAL (c.1490-1530), usually called RAFFAELLINO. An Italian painter, born at Colle, near Borgo San Sepolero (Tuscany). He was a pupil of Raphael, and afterwards worked with Giulio Romano. He was employed by Raphael to assist in painting the Loggia of the Vatican, and portions of the story of Moses are from his brush. After his master's death he worked with Giulio Romano in Rome, and in the Piazza del Te at Mantua. Still later he assisted Bronzino and Vasari in various decorative schemes. He opened a bottega in Borgo, San Sepolero, and several of his scholars became fair artists, but none rivaled 'little Raphael.' He painted in the manner of his master, but was not a servile imitator. His style is pure, his figures very noble, and he manages drapery in that grand way characteristic of the Roman School. In general it may be said that no other painter carried on the traditions of that school so successfully as Colle. His principal works are "The Resurrection," in the Church of San Rocco, Borgo San Sepolero; the same subject in the cathedral; the beautiful "Assumption" in the Church of the Conventuali; an "Annunciation," in San Francisco at Cagliari; "Twelve Apostles," in the cathedral at Urbino (very Raphaellesque); and several works in the chapel of the Olivet monks at Gubbio.

COLLECT. A brief, comprehensive prayer varying (like the epistle and gospel, which it

immediately precedes) with the season of the Church year. Such prayers are found in all the earlier Christian liturgies, and most of those now used come from the sacramentaries of Saint Leo, Gelasius, and Saint Gregory. The name (which, however, does not occur in the Roman missal, where the word *oratio*, prayer, is used) is also of great antiquity. It probably comes from *collecta*, in the sense of *collectio*, a gathering, the prayer being originally designated *oratio ad collectam*. In the oldest liturgies only a single collect was used, but with the growth of the calendar it became customary to 'commemorate' a festival which was displaced by one of greater importance with the use of its collect; the sacred number of seven, however, might never be exceeded. In the Roman missal two other prayers, the *secretæ* and the *communio*, are of similar structure to that of the collect, and, like it, vary with the day. These were not retained in the Anglican prayer-book, which has almost literal translations of the Latin collects for nearly all its services. In the morning and evening prayer of this book, as in all the offices of the Roman breviary except prime and compline, the collect for the day is repeated, to link the other offices with the eucharistic service. The structure of the collect is simple and uniform. It begins with a form of address nearly always to God the Father, generally including a commemoration of the special event celebrated, then offers as a rule a single petition for some grace or blessing, and ends normally 'through Jesus Christ our Lord, who with Thee and the Holy Ghost liveth and reigneth, one God, world without end.'

COLLECT, THE, or COLLECT POND. Formerly a large pond in the city of New York, part of whose site is now occupied by the Tombs prison. It drained the district later known as the Five Points, and discharged into the Hudson River by a channel through the present Canal Street. The name 'Collect' was a corruption of the Dutch 'Koleh Hoek,' meaning 'shell point' (Fiske, *Dutch and Quaker Colonies*, 1899).

COLLECTA'NEA (Lat. nom. pl. collected, sc. *dicta*, sayings). A name given to literary collections of any description, as, for instance, sayings of noted men, aphorisms, jests, miscellaneous anthologies, and chrestomathies.

COLLECTIVISM (Fr. *collectivisme*, from *collecter*, ML. *collectare*, to collect, from Lat. *collecta*, collection, assembly, from *colligere*, to collect, from *con-*, together + *legere*, to gather). A scheme for economic reform which would, in place of the competitive system of to-day, based on the individual ownership and control of the means of production, transportation, and distribution, substitute an arrangement by which all or part of these functions would be undertaken systematically by collective action. Generally, the organization proposed for this collective undertaking is the city or State; and in such a case Collectivism is synonymous with State Socialism. The advocates of Collectivism maintain that competition, which is wasteful and self-destructive, should give way to conscious co-operation; they point to the present public management of the postal system as an example of Collectivism, and urge the application of the same method to the production, transportation, and distribution of all the necessities of life.

COL/LEEN BAWN, THE (Ir. *cailin*, girl, dim. of *caille*, girl, and Ir. *babhun*, Gael. *babhunn*, bawn, inclosure of a castle, barn-yard), or THE BRIDES OF GARRY-OWEN. A play by Dion Boucicault, produced September 10, 1860, based on Griffin's *The Collegians*. It was republished in the form of a novel in 1861.

COLLEGE (Fr. *collège*, Lat. *collegium*, assembly, from *collega*, associate, from *con-*, with + *legare*, to send on an embassy, from *lex*, law, connected with *legere*, AS. *liegan*, Ger. *liegen*, Engl. *lie*, Gk. *λέγος*, *lechos*, couch). In its early Roman use, 'college' signified any association of persons having a common purpose or performing a specific function. In some respects it was synonymous with *corpus*, a corporation or body of members, with *universitas*, a whole as contrasted with its parts, and with *societas*, a partnership. The Roman college was required to be incorporated by public authority, could possess common property, and could sue or be sued in the name of its manager. Many of these colleges were mercantile in character or were organizations of artisans similar to the mediæval guilds; but there were others having religious or political objects, such as the college of augurs, pontiffs, etc. In modern usage the term has similar applications, as college of cardinals, college of bishops, college of presidential electors, etc. It is also, especially in Great Britain, applied to associations of scientific or literary purposes, such as College of Physicians, College of Surgeons, College of Heraldry.

In educational usage the term 'college' commonly indicates a stage of instruction intermediate between the high school or preparatory school and the university; but there are some noteworthy exceptions, especially the Collège de France in Paris. The word 'college' in this sense is nearly equivalent to *lycée* and *gymnasium*. The early colleges grew out of the monastic care of the indigent, sick, and feeble, and were at first, in connection with *hospitia*, established by the various orders. In 1180 a foundation for eighteen 'scholar-clerks' was made in the 'Hospital of the Blessed Mary of Paris,' commonly known as the Hôtel-Dieu. Other foundations devoted solely to this purpose soon followed. During the same period it was customary for groups of students to organize for the purpose of renting rooms, providing board, etc. Such organizations were self-governing, though ordinarily, and soon by compulsion, their governors were masters in the university. Sometimes, too, as at Bologna, alien needy students had national boarding-houses under this name, as the College of Spain, etc. Under the influence of the mendicant orders and the example of Robert de Sorbonne, who about 1255 founded the college which bears his name for students who had already taken the earlier degree, colleges became more numerous, assumed the teaching function within their own walls, and tended to become co-extensive with the university. In time, both in Paris and in the English universities, every member of the university had to attach himself to some college, and every person admitted to a college had to matriculate at the university. In this way the colleges became the constituent members of the university, supporting not only the students and fellows, but the professors as well. For a more detailed account, see CAM-

BRIDGE, UNIVERSITY OF; OXFORD; PARIS, UNIVERSITY OF, etc.

In this relation, the college becomes a sub-corporation. The English universities hold the examinations and grant the degrees, while the colleges provide for the lodging of the students, to a certain extent for their support, and for their instruction. Students in one college may receive instruction in other colleges. In Scotland and in America the distinction between the college as the member and the university as the body has been neglected; and we consequently hear of the one and the other indiscriminately granting degrees, a function which in the English and in the original European view of the matter belonged exclusively to the university. *Barnard College*, *Columbia*, and *Sibley College*, *Cornell*, however, besides many correlated professional colleges, may be said to illustrate the older usage. Where there is but one college in a university, as is the case in the universities of Scotland, the two bodies are of course identical, though the functions which they perform are different. The University of Dublin and Trinity College are also virtually the same. In Germany there are no colleges in the English sense; and the verbal confusion between the college and the university is avoided by the latter's performing the functions of both in its own name, as two separate parts of its proper duties. In France, *collège* has a meaning totally different from that which we attach to the word; it is a school, corresponding, however, more to the *gymnasia* (q.v.) of Germany than to the grammar schools of this country. All the colleges are placed under the University of France, to which the centralizing tendencies of that country have given a meaning which also differs widely from that which the term university bears in England. See also COEDUCATION; COLLEGES, AMERICAN; COLLEGIATE EDUCATION FOR WOMEN; DEGREE; DUBLIN, UNIVERSITY OF; EDINBURGH UNIVERSITY; HARVARD UNIVERSITY; SORBONNE; YALE UNIVERSITY; and the names of individual colleges, universities, and other higher institutions.

COLLÈGE DE FRANCE, *kôlèzh' de frâns* (Fr., College of France). A college in Paris, founded between 1518 and 1545 by Francis I., who tried in vain to secure Erasmus for its head. From the beginning, it has been autonomous. The successive kings upheld its independence, notwithstanding the vigorous efforts of the University of Paris to secure control: this independence has been maintained, and though now under the charge of the Minister of Public Instruction, it has no connection with the University of France. From this has resulted its distinguishing characteristic: freedom of teaching and the encouragement of scientific research. The *collège* has had varying fortunes, but its activity has been continuous; even during the Revolution, although it had been the royal college, its reputation saved it from suspension. Originally founded for the teaching of Hebrew, Greek, and Latin only, it has now forty different chairs. Instruction is gratuitous, no examinations are held, no diplomas given. The *collège* is specially designed to attract pupils other than the ordinary university students. In its long roll of illustrious teachers are included the names of Ramus, Gassendi, Rollin, Sylvestre de Sacy, Barthélemy Saint-Hilaire, Laboulaye, Renan, Michelet, and Gaston. Consult: Goujet, *Le*

Collège Royal de France (Paris, 1758); *Bouchon-Brandely, Le Collège de France* (Paris, 1873); *Lefranc, Histoire de Collège de France* (Paris, 1892); *Renan, Questions contemporaines* (Paris, 1868).

COLLEGE JOURNALISM. See JOURNALISM, COLLEGE.

COLLEGE OF ARMS. See HERALDS COLLEGE.

COLLEGE OF ELECTORS. See ELECTORAL COLLEGE.

COLLEGE OF HERALDS. See HERALDS' COLLEGE.

COLLEGE OF THE FOUR NATIONS (Fr. *Collège des Quatre Nations*). An appellation given to the *Collège Mazarin*, founded 1661, from the fact that that university was founded for the free education and support of sixty sons of gentlemen residing in the provinces of Pignerol, Alsace, Flanders, and Roussillon.

COLLEGE PARK. A village in Prince George County, Md., 8 miles northeast of Washington, D. C., on the Baltimore and Ohio Railroad. It has a fine situation, as a suburb of the capital, and is the seat of the Maryland Agricultural College and Experiment Station, established 1850. Population, in 1900, about 300.

COLLEGES, AMERICAN. The offspring of European colleges, and possessing at first the same general form of organization. American colleges have gradually undergone changes which make them distinctive. Harvard (q.v.), the oldest, was founded in 1636, under the influence of men who for the most part had received their education at Emmanuel College, Cambridge University. The second American college, William and Mary (q.v.), founded in 1693, and the third, Yale (q.v.), founded in 1701, were modeled on similar lines. The numerous institutions founded since then have followed very closely the same traditions. During the eighteenth century there were 21 such institutions founded, 9 before the Revolution and 12 afterwards. From 1800 to 1830 there were 33 such foundations; from 1830 to 1863 there were 180; from 1865 to 1900 there were 244, making a total of 480 degree-conferring institutions of college rank.

The early colleges were separate institutions of learning, each offering a single prescribed course of study leading to the degree of A.B., and, with some additional work, to that of A.M. This course was intended to furnish a liberal education, and to prepare the student for the Christian ministry or other learned profession. Both Harvard and Yale came under the control of self-perpetuating corporations, and relied for their support on tuition and private endowments. Most of the earlier and many of the later colleges were controlled in the interest of certain religious denominations, it being frequently part of the organic law of such institutions that the president and trustees should be members of the Church that dominated the school.

The leading changes in the early college system have been the outcome of a demand for a wider circle of studies in the liberal programme; the development of better systems of secondary instruction, to which could be intrusted a large part of the work formerly done by the college; the growth of specialized instruction preparatory to the various professions not only of law, medicine, and theology, but also of the various fields

of applied science; and the appearance of higher institutions under the support and control of the States, notably in the West and the South. In many of the colleges, also, e.g. Harvard, Yale, and Columbia, the influence of the sectarian element in control has largely disappeared. The development about the nucleus of a college of liberal arts of colleges for special professional instruction has led to the university, so called, although many institutions bearing that name give very little attention to graduate instruction of the true university character.

At first, the Colonial colleges took from the grammar schools students who had barely attained a fair knowledge of Latin. As the character of secondary instruction grew better, the entrance requirements of the colleges grew severer. As a result, the average age of entrance of students increased, until at Harvard it is at present over nineteen, an age at which students were commonly graduated in the earlier history of the institution. The curriculum, originally limited to Latin, Greek, a little mathematics, logic, metaphysics, rhetoric, and theology, was extended by the introduction, in the latter part of the eighteenth century, of astronomy and natural philosophy, and, early in the nineteenth century, of modern languages and the elements of the natural and political sciences. This process of expansion led, by the middle of the nineteenth century, to the elective system (see ELECTIVE COURSES), fostered by President Wayland of Brown University, and later by President Eliot of Harvard, President Barnard of Columbia, and President Tappan of Michigan. Certain work was still prescribed to the student, but new work was offered from which he was allowed to make a choice. Then, at many colleges, various courses were established, among which election could be made. The required subjects in each course were from some general field, as science, literature, modern languages, or classics, and distinct degrees, as B.S., Ph.D., B.L., etc., were bestowed upon the graduates of the different courses. Brown, Michigan, and Western institutions, generally, illustrate this plan. Finally, at Harvard in 1869, the right of election was extended to all subjects beyond the first year, the degree of A.B. being given to all graduates of the college of liberal arts. To emphasize the equality of different lines of work thus elected, the Stanford University has adopted the policy of granting this degree even to those whose work has been almost entirely in the sciences. Cornell, too, has in this, as in many other respects, assumed the most liberal attitude in its educational aims.

Along with the development of broader curricula, and elective subjects and courses, has come the establishment of special professional colleges and colleges of applied science. Medical schools had appeared at the University of Pennsylvania and at Columbia and Harvard in the eighteenth century. Law schools were founded early in the nineteenth century, and scientific schools soon after. Some of these institutions were affiliated with older colleges, others were established independently. The year 1846 saw the foundation of the Union College of Civil Engineering, the Sheffield Scientific School, Yale; and the next year the Scientific School at Harvard was established. Finally, there appeared the extension of the work of the liberal

arts college into further fields of scholarship and research, the organization of which has given rise to the graduate departments, the universities proper of the United States. (See UNIVERSITY.) But the distinction of the university from the college or group of colleges for undergraduates has not yet been clearly made. Some institutions calling themselves universities are merely colleges; others consist of several undergraduate colleges; in a few cases the name 'university' is restricted to purely graduate departments.

It must be added that the professional colleges of law, medicine, and theology are coming to have more and more the character of graduate schools. In 1896 Harvard required all students entering the law school to be college graduates. A similar requirement exists in its medical school, and practically in its divinity school as well. Like steps are being taken at Columbia, and the matter is being agitated generally throughout the country. It must be noted, however, that so far no important movement has been set on foot to make the colleges of applied science graduate schools. In case they follow in the path of the schools of law, etc., the special preparation for the higher professions, together with higher training in research and scholarship, will be left to the university, while the college will represent a higher liberal course preparatory to these. As it is, the word college is applied either to (1) liberal arts colleges, or (2) professional colleges admitting undergraduates; and colleges of either type may be parts of universities or separate institutions.

The character of the influences and the life surrounding the student in the college which has grown into a large university is essentially different from that to be met with in the smaller colleges which have continued to work in the spirit of the old Colonial institutions. The smaller college affords less opportunity for election, thus bringing about greater uniformity in the work pursued. While it does not allow so much for individual peculiarities, it provides greater chance for intimate social intercourse among students, and between them and the faculty, and for a firmer grip of the latter in discipline. The educational aim is frankly liberal and social rather than special and individual. Fraternities are an important feature in the social life, athletics prosper, and college spirit is strong. The faculty is even more a teaching body than a learned one, the reverse of which tends to be the case in the larger universities. Many believe that the smaller college affords a better liberal education for one who will later take up a profession or pursue special lines of research at a university. Again, the entrance requirements of the smaller college are often not quite so severe as at the university college, and this makes possible a shortening of the long period of preparation for a profession. On the other hand, the attendance at the smaller college is not increasing in proportion to that in the collegiate departments of the universities. The length of the liberal college course has been a matter of much agitation. Many advocate its reduction to three years; and President Butler, of Columbia, in his first annual report to the trustees of that university, proposed to award the B.A. degree at the end of the second year of undergraduate study. According to the present sys-

tem, a student, beginning at six years of age, and progressing at the normal rate, will enter the college at eighteen, and not until twenty-two begin his special professional training. To gain time, in many universities, the senior collegiate year is allowed to be partly spent in professional work. At Chicago the specialized work may begin in the junior year. The system of credits, too, generally in vogue, by which the satisfactory completion of a certain amount of work entitles a student to his degree, without regard to the time required to accomplish it, often renders graduation possible in less than four years.

The entrance requirements and curricula of the colleges have varied widely. Many colleges, especially in the West and the South, are yet little more than high schools. Some of the States have, however, interfered to determine what institutions shall be authorized to grant degrees, and it is highly desirable that this example should be universally followed. Attempts have also been made among the better colleges to insure greater uniformity in entrance requirements. The colleges of the Middle States and of Maryland united in 1899 in the formation of a general entrance examination board. In the West, the State universities set the standard for collegiate entrance requirements within their several commonwealths.

It remains to mention a few new methods of control that have come to prevail over American colleges. Originally, they were all governed by corporations or boards of trustees, and were chartered either by the King or by Colonial legislatures. The older institutions have retained these charters, with the obvious modifications necessary after the Revolution. A little later, a movement was set on foot to take the colleges under State supervision and control, but it was checked by the decision in the Dartmouth College case, by which States were prevented from assuming control over the property of corporations existing by virtue of a charter sanctioned by their legislatures. The result was that the older Eastern foundations remained under private management, while in the West and the South the system of State universities—usually merely colleges—grew up. These institutions are controlled by regents appointed in various ways, often by the Governor of the State, although in Michigan they are elected by the people. In some of the Eastern institutions also the State has come to exercise a voice in the governing board. Ordinarily, the control of these private colleges is in the hands of a self-perpetuating board, which controls the finances, appoints the instructors, makes laws for the government of the institution, and confers degrees. The instruction and discipline of the students, their admission and dismissal, and the recommendations for degrees are left in the hands of the faculty as a matter of immemorial custom. Much general power is lodged in the hands of the president, and in the university colleges the deans are intrusted to a large extent with the control and direction of the students. In 1899-1900 the number of students (men and women) in institutions of higher learning, including technical and professional schools, was 98,923. This is an increase of over 100 per cent. in actual attendance within the period of ten years, and of over 100 per cent. in the ratio of students to popula-

tion within the period of twenty-seven years. The ratio of increase is highest with graduate students and with women, thus indicating the lines of present development in the work of higher education. The total number of professors and instructors in the same institutions amounted at the given date, in round numbers, to about 14,000. The value of their property was estimated at \$360,594,525, and the annual income was \$28,558,463. See COLLEGIATE EDUCATION FOR WOMEN; ELECTIVE COURSES; UNIVERSITY; and the various colleges.

COLLEGE VIEW. A village in Lancaster County, Neb., a few miles south of Lincoln, the State capital. It is the seat of Union College (Seventh-Day Adventist), opened in 1891. Population, in 1900, 865.

COLLEGEVILLE. A village in Stearns County, Minn., 10 miles west by north of Saint Cloud; on the Great Northern Railroad (Map: Minnesota, D 5). It is the seat of Saint John's University (Roman Catholic), opened in 1867. Population, about 130.

COLLEGEVILLE. A borough in Montgomery County, Pa., 25 miles northwest of Philadelphia; on the Perkiomen River and on the Philadelphia and Reading Railroad (Map: Pennsylvania, F 3). It is the seat of Ursinus College (German Reformed), opened in 1870; has a bridge over one hundred years old; and manufactures boilers and machinery. Collegeville was incorporated as a borough in 1895. Population, in 1900, 611.

COLLEGIANS, THE. A novel by Gerald Griffin (1829). An edition appeared in 1861 under the new title, *The Colleen Bawn, or the Collegian's Wife*, illustrated by Phiz.

COLLEGIANTS (from Lat. *collegium*, assembly). A branch of the Dutch Calvinists, who called their assemblies for worship 'colleges.' The sect was founded in 1619 by the brothers John, Adrian, and Gilbert van der Codde, at Rijnsburg, a couple of miles north of Leyden; hence they were also called the Rijnsburgers. They rejected creeds, and had no regular ministry, nor any form of church government. They adopted baptism by immersion, but their communion was open to all. They were not unlike the Plymouth Brethren of the present day. They opposed war and office-holding by Christians. They became extinct in the eighteenth century.

COLLEGIATE CHURCHES (from Lat. *collegiatus*, member of a college, from *collegium*, assembly). A title applied to certain churches other than cathedrals to which is attached a body of clergy living in community. (See CAXON: CHAPTER.) Of the numerous collegiate churches which flourished in Germany as early as the time of Charlemagne, that of Aix-la-Chapelle was especially famous. In England after the Reformation the title was retained, without much of the organization, as in the cases of Westminster, Windsor, Wolverhampton, Heytesbury, Southwell, Middleton; also Brecon in Wales, and Galway in Ireland. Ripon and Manchester have been constituted the cathedrals of new dioceses. The term is also applied to churches with an associated body of clergy, without episcopal supervision. The best-known instance is the Collegiate Reformed Dutch Church of New York City.

COLLEGIATE EDUCATION FOR WOMEN. A system of education which originated in the United States, and may be said to have sprung from the seminaries for young women. Although at first these were frequently concerned with somewhat superficial accomplishments, the trend was rapidly toward a sounder and broader scholarship. Their development, and later, that of the coeducational public high schools, led to the establishment of women's colleges and to the admission of women to colleges for men.

In 1808 Mrs. Emma Willard (q.v.) opened a school for young women at Middlebury, Vt. In 1819 she removed by invitation to Waterford, N. Y., and ten years later founded the celebrated Troy Female Seminary. By earnest and effective advocacy, notably by the publication of her *Plan for Improving Female Education*, she succeeded in getting the recognition and to some extent the aid of the State of New York in her efforts to give to women the same educational opportunities as to men. In 1819 Rev. Joseph Emerson opened a female seminary at Byfield, Mass., where such instruction was given as is done in academies for men. One of his students, Miss Zilpah P. Grant, became in 1824 the first preceptress of Adams's Female Academy at Derry, N. H. In 1828 she became the principal of a seminary at Ipswich, Mass., associating with her her fellow pupil at Byfield and assistant at Derry, Mary Lyon (q.v.). It was the latter's efforts, aided by the advice and plans of Miss Grant, that led to the founding and endowment in 1837 of Mount Holyoke College (q.v.) at South Hadley, Mass. This institution gave a three years' course nearly equivalent to that of the better colleges for men. Another prominent woman in the early history of advanced education for women was Miss Catherine E. Beecher (q.v.), who opened in 1827 a seminary for girls at Hartford, Conn., and in 1829 published an influential pamphlet on *Suggestions Respecting the Improvement of Female Education*. Later she turned her attention to the West, and through a national board and society did much for improving the facilities as well as for developing a sentiment for the higher education of her sex. In 1821 Wesleyan Seminary and Female College was founded at Kent's Hill, Maine, and in 1834 a similar institution was established at Granville, Ohio. Georgia Female Seminary at Macon (now Wesleyan Female College) was chartered with collegiate powers in 1836, and in 1839 it was opened, offering a four years' course. Monticello Female Seminary, at Godfrey, Ill., was opened in 1838 on the plan of colleges for men, and it soon gained great reputation and influence. Elmira College, at Elmira, N. Y., claims to be the first women's college in the United States, and probably in the world, to establish the same standard as in colleges for men. It was founded in 1855 and offered a four years' course. Vassar College (q.v.) was opened in 1865 at Poughkeepsie, N. Y.; Wellesley College (q.v.) at Wellesley, Mass., and Smith College (q.v.) at Northampton, Mass., in 1875; and Bryn Mawr College at Bryn Mawr, Pa., in 1885. These four, with the Woman's College (q.v.), Baltimore, are to-day the wealthiest of the female colleges in the United States. In 1888 Mount Holyoke College established a full collegiate department, and in 1893 the seminary was dropped. Wells College (q.v.) opened at

Aurora, N. Y., in 1868 as a seminary, became a college in 1870, and in 1896 dropped the preparatory department. Besides these institutions, there were in 1898 139 institutions for women in the United States calling themselves with more or less correctness colleges. This represents a decline in number as compared with the preceding ten years, but it has been far more than made up by the increased attendance at the better women's colleges and the coeducational institutions. The latter are discussed in the article on COEDUCATION.

An additional class of schools offering higher instruction to women are the colleges affiliated with institutions for men. Of these the earliest to be established in the United States was Radcliffe College (q.v.), instruction in which is carried on by certain members of the Harvard faculty. It was founded by the Society for the Collegiate Instruction of Women in 1879, and assumed its present name with power to grant degrees in 1894. Barnard College (q.v.), founded in 1889, and at first affiliated with Columbia as Radcliffe is with Harvard, was made in 1900 an undergraduate college of the university, graduate work in that institution being thrown open to women. Brown University has a women's college that began work in 1892. The College for Women of Western Reserve University, at Cleveland, Ohio, was established in 1888, and in connection with Tulane University at New Orleans, La., there was opened in 1886 the H. Sophie Newcomb Memorial College for Women. Evelyn College, connected with Princeton University, was opened in 1887, but ceased to exist in 1897.

The attitude of the universities of Europe toward the admission of women is described in the article on COEDUCATION. In Great Britain there are many women's colleges connected with the great universities. At Cambridge, Girton College was opened in 1869 and Newnham College in 1871. At Oxford, Somerville Hall and Lady Margaret Hall were opened in 1879, and Saint Hugh's Hall in 1886. At the University of London, University College and King's College have departments for women. Bedford College for Women was opened in 1849, and Royal Holloway College in 1886. There are also numerous local colleges affiliated with various universities in England and Wales. In Ireland, Queen's College, Belfast; Queen's College, Cork; and Queen's College, Galway, are affiliated with the Royal University of Ireland. In Scotland, University College at Dundee is a college for women affiliated with the universities of London, Saint Andrews, Edinburgh, and Glasgow. At Glasgow, Queen Margaret College was in 1892 affiliated with the university at that place. On the Continent, however, women's colleges have not been established. Private training and 'finishing' schools suffice for those who do not enter the universities. In the various professions women find no chance for instruction to any extent in separate institutions except in the case of medicine. In the United States there were in 1898 seven medical schools for women. In London there is one, and Edinburgh has two; several are in Canada, and one at Saint Petersburg.

The development of opportunities for the higher education of women has been actively promoted by a number of organizations, prominent among which are, in the United States, the

Massachusetts Society for the University Education of Women, founded in 1877, and the Association of Collegiate Alumnae, founded in 1882; and in England the Girls' Public Day School Company, founded in 1874, and the Cambridge Association for the Promotion of the Higher Education of Women, established in 1879. An organization for similar purposes was in 1898 formed in Berlin. The development of opportunities for the university education of women has also had a favorable reaction upon facilities for their secondary instruction not only in the United States, but also in England and France, and to-day even the meagre system of girls' gymnasia in Germany is beginning to feel the influence of a demand that women shall be prepared for the universities. In 1898, however, the Prussian Minister of Education refused an application for the establishment of a girls' school in Breslau, saying that university education for women is only for exceptional cases, and that the Government will not undertake to prepare them for this.

Three statistical investigations into the health of college women have been undertaken, two in America by the Association of Collegiate Alumnae in 1885 and 1900, and one in England by Mrs. Henry Sidgwick in 1897. In America the health of the college women compared favorably with that of working women, and in England with that of non-college sisters and cousins. Nor does the marriage rate of college women seem to be less than that of their sisters. On the other hand, a large proportion of them are self-supporting, the principal occupation being teaching, which in 1895 was the business of 37 per cent. of the graduates of Vassar, and in 1898 of 49 per cent. of the graduates of Radcliffe College.

Consult: Thomas, "Education of Women," in Butler, *Monographs on Education in the United States* (New York, 1900); Fitch, "Women and Universities," in *Educational Aims and Methods* (New York, 1900); Lange, *The Higher Education of Women* (New York, 1900); French, "Educational Status of Women in Different Countries" (with bibliography), in *Report of United States Commissioner of Education* (Washington, 1894-95). See COEDUCATION.

COLLENCHYMA, kōl-lēn'kī-mā (Neo-Lat., from Gk. κόλλα, *kolla*, glue + ἔγχυμα, *enchyma*, infusion, from ἐν, *en*, in + χέω, *chein*, to pour). A supporting tissue in certain plants, usually developed just beneath the epidermis, and recognized by the prominent thickenings in the angles of the cells. See HISTOLOGY (OF PLANTS).

COLLEONI, kō'lyā-ō'nē, or **COLEONE**, kō'lā-ō'nā, BARTOLOMMEO (1400-75). An Italian general, born at the Castle of Solza, near Bergamo. He distinguished himself in the war between the Venetians and the Milanese. During the last thirty years of his life he was generalissimo of the Venetian State, in which capacity he is reputed to have displayed much strategical ability. A fine equestrian statue, executed by Andrea del Verrocchio, was erected to his memory near the Church of San Giovanni e Paolo in Venice.

COL'LES, CHRISTOPHER (1738-1821). An Irish engineer, the pupil of Pooceke. He was born in Ireland, but came to America before the Revolution and delivered lectures in New York on pneumatics, gunnery, and inland navigation. One of the first steam-engines made in the coun-

try was designed by him; and he was among the first to propose water-supply by reservoirs for the city of New York. As early as 1784 he presented to the New York Legislature a plan to connect Lake Ontario with the Hudson River by canals and such natural channels as could be used, and with this purpose in view he surveyed the Mohawk River.

COL'LETT, JAKOBINE CAMILLA (1813-95). A Norwegian novelist. The keynote of her work is the emancipation of woman. In addition to her first and most popular novel, *The Magistrate's Daughters* (1855), she wrote *Tales* (1861); *In the Long Nights* (1863); *Against the Stream* (1879; 2d series, 1885); *Last Leaves, Recollections, and Confessions* (1868, 1872, and 1873).

COLLET'TA, PIETRO (1775-1831). An Italian Minister of War and historian. He served with distinction in the army under Joseph Bonaparte upon the latter's accession to the throne of Naples in 1806, and was retained in his military dignities by Ferdinand I. In 1820 he was dispatched to suppress the insurrection in Sicily. Appointed Neapolitan Minister of War in 1821, he was afterwards imprisoned by the Austrians, but was finally permitted to reside in Florence, where he wrote his well-known historical work, *Storia del reame di Napoli, 1734-1825* (first published in 1834; German trans. by Leber, 8 vols., Grimma, 1849-50).

COL'LEY, SIR GEORGE (1835-81). An English soldier. He was educated at the Royal Military College, Sandhurst, served in Cape Colony as a lieutenant, was a border magistrate there in 1857-58, was ordered to China, and as captain participated in the taking of the Taku forts in 1860. He was subsequently professor of military administration and law at the Staff College, Sandhurst. In 1875 he was promoted to a colonelcy for efficient service in Ashanti, and from 1876 to 1880 he was private secretary to Lord Lytton, at that time Viceroy of India. He was sent to succeed Sir Garnet Wolsley as Governor and commander-in-chief of Natal in 1880. In January, 1881, he commanded against the Boers at Laing's Neck and Ingogo, and on February 27 his detachment was annihilated at Majuba Hill (q.v.), and he himself fell.

COL'LIÉ. The Scotch shepherd dog. See SHEEP-DOG.

COLLIER, kōl'yēr, JEREMY (1650-1726). A non-juring English clergyman, born at Stow Qui, or Quire, in Cambridgeshire, September 23, 1650. He went to Cambridge in 1669, took his degree of M.A. in 1676, and entered the ministry. At the revolution of 1688 he plunged into the stormy waters of controversy, his foeman being Gilbert Burnet, afterwards Bishop of Salisbury. For a publication of his at this time, entitled *The Desertion Discussed* (1688), which maintained the invalidity of King William's regal authority and gave offense to the Government, he was sent to Newgate, where he remained several months. On his release he rushed anew into party contentions, and distinguished himself by the publication of several controversial works. Suspected of being a partisan of the Stuarts, he was again arrested in 1692 and imprisoned for a short time in the King's Bench. From this period his life was a perpetual literary strife, the

Government being the principal object of his attack. In 1713 he was consecrated a bishop among the non-jurors, and was their leading man after the death of Hickes in 1715. He died in London, April 26, 1726. Collier wrote many books, including the *Great Historical, Geographical, Genealogical, and Poetical Dictionary* (4 vols., 1701), founded on Moreri's, and *Ecclesiastical History of Great Britain to the End of the Reign of Charles II.* (2 vols., 1708-14). The best edition of the latter work is by T. Lathbury (9 vols., London, 1852). It is a work of great learning, the first of its kind except Fuller's that had appeared. But the work by which he is best known is his *Short View of the Immorality and Profaneness of the English Stage* (1698), in which he attacked Dryden and Congreve as vigorously as D'Urfey, and which had a marvelous success. For his life, consult the *Ecclesiastical History*, edited by Lathbury (London, 1852).

COLLIER, JOHN PAYNE (1789-1883). An English Shakespearean critic and commentator. He was born in London. In 1820 he published *The Poetical Decameron*. From 1825 to 1827 he superintended a new edition of Dodsley's *Old Plays*; and in 1831 appeared his best work, a *History of English Dramatic Poetry, and Annals of the Stage*. From 1835 to 1839 he published three volumes on Shakespeare entitled *New Facts, New Particulars, and Further Particulars*, followed by an edition of Shakespeare in eight volumes (1842-44). Not content with these efforts for the illustration of his favorite author, Collier, in 1852, published a volume entitled *Notes and Emendations to the Text of Shakespeare's Plays, from Early Manuscript Corrections in a Copy of the Folio of 1632, in the Possession of J. P. Collier*. This volume is now known as the Perkins Folio, as 'Tho. Perkins his Booke' is inscribed on the cover. The publication excited great commotion in the literary world: opinion was divided, and the *Emendations* were furiously applauded or furiously assailed. It has since been proved that all the marginal notes are forgeries. In 1862 he published an excellent edition of Spenser; and the next year he began a series of reprints of our early poets and pamphleteers. Of his later publications, the most interesting is *An Old Man's Diary* (1871-72). For a list of Collier's forgeries, and the bibliography of the subject, consult: Lee, *A Life of Shakespeare* (3d ed., London, 1900); and Warner, *Catalogue of MSS. of Dulwich College* (London, 1881).

COLLIMATION. See MERIDIAN CIRCLE; TRANSIT INSTRUMENT.

COLLIN, kō'lĕn', HEINRICH JOSEF VON (1772-1811). An Austrian dramatist and song-writer, born in Vienna. He became celebrated as the author of the patriotic *Wehrmannslieder* (1809), which insure him a permanent rank among those who by their songs stirred the heart of Germany to resistance against foreign oppression in the War of Liberation. His collected works were published by his brother (6 vols., Vienna, 1812-14).

COLLIN, kō'lān', LOUIS JOSEPH RAPHAEL (1850—). A French painter. He was born in Paris and studied there at first under Bouguereau, and then under Cabanel. In 1873 he obtained a second-class medal with "Le sommeil." After that he exhibited constantly at the Salon.

and in 1887 received the Grand Prix de Rome. His portraits are particularly fine, and he has painted in an admirable manner on faience; but Collin is especially noted for his painting of the nude in the open air, the best example of which is "Floréal" (1886), in the Luxembourg. The Museum of Arras has an "Idyl" by him, and the Museum of Alençon his "Daphnis and Chloe" (1877).

COLLIN D'HARLEVILLE, kō'lān' dār'l'vĕl', JEAN FRANÇOIS (1755-1806). A French dramatist. He was born at Mévoisins, near Maintenon, and after studying law devoted himself entirely to literature. His numerous character-plays, which occasionally suggest the influence of Regnard, are noted for their gaiety, wit, and comic episodes. The more popular are *L'inconstant* (1786); *L'optimiste* (1788); *M. de Crac dans son petit castel* (1791); *Le vicieux célibataire* (1793), usually considered his best production; *Les châteaux en Espagne* (1803). The best edition of his dramatic works is that by Andrieux (Paris, 1822).

COLLINEARITY. See CONCURRENCE.

COLLINE (kō'lĭn) GATE, THE (Lat. *Porta Collina*, hill-gate, from *porta*, gate, and *collinus*, hilly, from *collis*, hill). An ancient gate of Rome on the Quirinal, beside which Fulvius encamped, B.C. 211, to oppose the entrance of Hannibal. According to Ovid, the Carthaginian general rode up to it and hurled a spear into the city. The victory won here by Sulla over the Marian forces (mainly Samnites), in B.C. 82, made his power supreme in Rome. The gate was discovered in 1873, but was destroyed in building the Treasury.

COLLINGWOOD. A suburban municipality of Melbourne (q.v.), Victoria, Australia (Map: Victoria, E 4). Population, in 1891, 35,100; in 1901, 32,800.

COLLINGWOOD. A town and port in Simcoe County, Ontario, Canada, on Georgian Bay, Lake Huron, 94 miles northwest of Toronto (Map: Ontario, C 3). It is important as the terminus of the Northern Railway on the line of travel to and from Lake Superior. It has tanneries, breweries, and flour-mills, a large lumber and grain trade, and regular steamer communication with other lake ports. It has a United States consulate. Population, in 1891, 4939; in 1900, 5755.

COLLINGWOOD, CUTHBERT, Lord (1750-1810). A British admiral, born at Newcastle-upon-Tyne. He went to sea as a midshipman at the age of eleven, and in 1775 took part in the battle of Bunker Hill and was made a lieutenant for his services. He became a commander in 1779 and a rear-admiral in 1799. Among the great naval victories in which he bore a prominent part were those of Lord Howe off Brest in June, 1794; of Lord Jervis off Cape Saint Vincent in 1797; and of Nelson at Trafalgar in 1805, where he held the second command. In the last-named engagement his ship was the first to break through the line of French and Spanish vessels, and after Nelson had received his death-wound he assumed the chief command. For his gallant conduct in this battle he was raised to the peerage.

COLLINS, ANTHONY (1676-1729). An English author, a noted free-thinking writer on reli-

gious questions. He was born at Isleworth or at Heston, near Hounslow, in Middlesex, June 21, 1676. He studied at Eton, and King's College, Cambridge, and in the Temple in London. In 1707 he published his *Essay Concerning the Use of Human Reason*; and in 1709, his *Priestcraft in Perfection*, which disturbed the churchmen of that time exceedingly. The controversy excited by this last work induced Collins to sum up several previous pamphlets in his *Historical and Critical Essays on the Thirty-nine Articles* (1724). He had published a *Defense of the Divine Attributes* (1710), in reply to the Archbishop of Dublin, who asserted the compatibility of divine predestination and human freedom. Collins was a philosophical necessitarian, and afterwards advocated his opinions more fully in his *Philosophical Inquiry Concerning Liberty and Necessity* (1715). In 1711 he went to Holland, where he made the friendship of Le Clerc and other eminent *litterati*. On his return to England, he published his *Discourse of Freethinking* (1713), the best known and the most important of all his works, which Swift assailed in one of his best pieces of irony, while Bentley disposed of its pretensions to scholarship. In 1718 he was made treasurer for the county of Essex; and in 1724 appeared his *Grounds and Reasons of the Christian Religion*, which gave occasion to no less than thirty-five replies. He defended himself in his *Literal Scheme of Prophecy*; and in 1727 published his last work, *A Letter to the Rev. Dr. Rogers on Occasion of His Eight Sermons on the Necessity of Revelation and the Truth of Christianity*. Collins died December 13, 1729. He was a friend and correspondent of Locke, who declared that Collins had as much love of the truth for the truth's sake as ever he had met in anybody. His character for integrity and benevolence stood very high.

COLLINS, JOHN (1625-83). An English mathematician, born at Wood Eaton, in Oxfordshire. He was a man of great natural ability and devoted to mathematics; was a member (1667) of the Royal Society of London, and carried on an extensive correspondence with the leading mathematicians of his day. Writers are much indebted to his *Commercium Epistolicum* (published by the Royal Society in 1712) for information on contemporary discoveries, as well as on the great controversy of Newton and Leibnitz. Consult: Rigaud, *Correspondence of Scientific Men of the Seventeenth Century* (Oxford, 1862).

COLLINS, JOHN CHURTON (1848—). An English educator and author. He was born at Bourton-on-the-Water, Gloucestershire, and graduated at Balliol College, Oxford, in 1872. He contributed largely to the reviews, strenuously opposing the philological method of literary study, and was active in the university extension movement. He is a writer of great force and wit, and combines accurate scholarship with a lucid and luminous literary style. Besides editions of Cyril Tourneur (1878), Lord Herbert of Cherbury (1881), Robert Greene (1899), and other English authors, he published *Sir Joshua Reynolds as a Portrait-Painter* (1874); *Bolingbroke and Voltaire in England* (1886); *Study of English Literature* (1891); *Illustrations of Tennyson* (1891); *The Early Poems of Tennyson*, with bibliography and various readings

(1900); *Ephemera Critica* (1901); *Dan Swift* (1893); and *Essays and Studies* (1895).

COLLINS, JOSEPH WILLIAM (1839—). An American pisciculturist. He was born at Isleboro, Maine, and when very young was employed on a fishing vessel. He afterwards became established at Gloucester, Mass. He prepared statistics on the New England fisheries for the Tenth Census, and also submitted the results of his investigations to the United States Fish Commission. He represented the United States at the International Fisheries Expositions held at Berlin in 1880, at London in 1883, and at Bergen, Norway, in 1898; and he was director of the Department of Fisheries during the Columbian Exposition. In 1884 he organized the section of naval architecture in the United States National Museum, and was curator of the department for nearly ten years. He was appointed president of the Commercial Fisheries Association in 1894.

COLLINS, MORTIMER (1827-76). An English poet and miscellaneous writer, born at Plymouth. He was master of mathematics for a time at Queen Elizabeth's College, Guernsey, but resigned in 1856, and devoted himself thereafter wholly to literature. His publications include: *Idyls and Rhymes* (1865); *Sweet Anne Page* (1868); *The Secret of Long Life* (1871); and *The British Birds, from the Ghost of Aristophanes* (1872). His wife, Frances, published *Letters and Friendships of Mortimer Collins, with Some Account of His Life* (London, 1877).

COLLINS, PATRICK ANDREW (1844—). An American lawyer and politician. He was born in Fermoy, Ireland, but was brought to the United States in 1848, and settled in Chelsea, Mass., where, while working as upholsterer, he prepared himself for the study of the law. In 1871 he graduated at the Harvard Law School, and in the same year was admitted to the bar. He was a member of the State Legislature in 1868-69 and State Senator 1870-71, served three terms in Congress (1883-89), and later, from 1893 to 1897, was Consul-General at London. He was an active Fenian and was chosen the first president of the Land League in 1884. He was elected Mayor of Boston in 1901.

COLLINS, REV. MR. A conceited and fawning character in Jane Austen's *Pride and Prejudice*.

COLLINS, WILLIAM (1721-59). An English poet. He was born at Chichester, where his father was a hatter, and received his education at Winchester College and at Oxford. In 1742 he published a small volume containing the *Persian Eclogues*, and in 1743 the *Epistle to Sir Thomas Hanmer*. These are not so characteristic of his talent as his later writings. Leaving Oxford, probably early in 1744, he went to London, resolved upon a literary career. Here, from time to time, he published other poems, consisting chiefly of odes; but misfortunes, occasioned by his indolence and irresolution, finally rendered him a prey to melancholy, which at times deepened into insanity. He died at Chichester. The poems which Collins left are comparatively few; but they entitle him to high rank among the poets of the eighteenth century. He was essentially a lyricist; and it is upon his odes that his reputation is principally founded. His most popular ode is *The Passions*. The

personification of the passions is true and striking, and the variation of the measure is well adapted to the various emotions to be expressed. Among his poems may be mentioned the odes, *To Liberty, To Mercy, To Evening, On the Death of Mr. Thomson*, the ode, written in 1746, beginning, "Hew sleep the brave who sink to rest," and the *Song from Cymbeline*. Not only is much of Collins's poetry exquisite, but it marks the beginning of English romanticism. This is particularly true of the *Ode on the Popular Superstitions of the Highlands of Scotland*, completed in 1749, but not published until 1788. Consult: Johnson, sketch of Collins in *Lives of the Poets* (Oxford, 1781); *Poems*, ed. Bronson (Boston, 1898); and Beers, *English Romanticism in the Eighteenth Century* (New York, 1899).

COLLINS, WILLIAM (1788-1847). An English painter of genre, born in London. His father was a journalist, but helped to eke out his living by dealing in pictures. Young Collins spent some time in the studio of Morland, but subsequently went to Italy, where he painted some Italian landscapes. His true love, however, was for child life, and he painted that in every phase; in the course of forty years he exhibited 121 pictures at the Academy. Among the most popular of these are his "Happy as a King," "The Little Flute-Player," "The Sale of the Pet Lamb," and "Boys with a Bird's Nest." He portrayed home life in various ways, and children were always introduced. The chief criticism against Collins's children is that they lack the unconscious air of childhood, and look as if they were on their good behavior. His technique resembled that of his master, Morland. In later years he attempted some religious subjects: "Christ in the Temple with the Doctors," and "The Two Disciples at Emmaus"; but afterwards wisely returned to his earlier style, for which he had much more gift. Others of his works are: "Scene in a Kentish Hop-Garden," "Sunday Morning," "Prawn-Catchers," and "Fishermen on the Lookout." He died in London. Consult: W. Wilkie Collins, *Memoirs of the Life of William Collins, Esq.* (London, 1849); Koehler, *English and American Painters* (New York, 1883).

COLLINS, WILLIAM WILKIE (1824-89). An English novelist. He was the eldest son of William Collins (q. v.), a landscape and portrait painter, and he received his favorite name from Sir David Wilkie. Born in London, he was educated privately at Highbury, and accompanied his father to Italy (1836-38). On his return to London he became a clerk in a London firm of tea-merchants (1841-46), and afterwards studied law at Lincoln's Inn, whence he was called to the bar (1851). He was already drifting toward literature. Even while in the London warehouse he turned his knowledge of Italy to good account in an historical romance entitled, *Antonina; or, the Fall of Rome* (not published till 1850): on the death of his father, he prepared an excellent memoir in two volumes (1848); and a visit to Cornwall resulted in a series of popular sketches called *Rambles Beyond Railways* (1850-51). Some time in 1851 he met Dickens, and this event decided his career. Thenceforth the two novelists were intimately associated, working at times in collaboration.

To *Household Words*, edited by Dickens, Collins contributed many tales, including the capital series of short stories known as *After Dark* (1856); and for *All the Year Round*, which was also conducted by Dickens, *The Woman in White* (1860), which met with instant success at home and abroad. In the meantime had appeared *Basil: A Story of Modern Life* (1852); *Hide and Seek* (1854); *The Dead Secret* (1857); and *The Queen of Hearts: A Collection of Stories* (1860). And among the numerous novels that followed are: *No Name* (1862); *Armada* (1866); *The Moonstone* (1868); *Man and Wife* (1870); *The New Magdalen* (1873); *The Frozen Deep, and Other Stories* (1874); *The Law and the Lady* (1875); *The Two Destinies* (1876); *The Fallen Leaves* (1879); *Heart and Science* (1883); *The Legacy of Cain* (1888); and *Blind Love* (1889). In 1873-74 Collins visited the United States, where he gave public readings from his own short stories. His last years were spent in seclusion. He died in London, and was buried in Kensal Green.

Soon after his acquaintance with Dickens, Wilkie Collins began to evolve a new type of novel, in which the study of character counts for little, and in which the main effort is given to the construction of a mystery so involved in details and circumstances as to baffle the reader. Of this kind *The Woman in White* and *The Moonstone* are masterpieces. Their literary value has indeed been questioned; but it must be admitted that, within his sphere, Collins had no equal among his contemporaries, several of whom—and Dickens among them—attempted to do the same thing and failed. For an appreciative study, consult Swinburne, *Studies in Prose and Poetry* (London, 1894).

COLLINS, PETER (1694-1768). An English naturalist. One of his pursuits was the naturalization of plants, flowers, and trees. He sent English plants to America and brought American plants to his own country, successfully introducing many species. He is also credited with first suggesting grape cultivation in Virginia.

COLLINS, SIR RICHARD (1811-83). An English naval officer. He entered the navy in 1823, in 1840 was appointed to the *Wellesley*, on which he served during the Chinese war, and in 1842 was promoted to be commander. In 1849 he commanded the *Enterprise*, which, with the *Investigator*, Commander McClure (q.v.), was sent by way of Bering Strait for the relief of Sir John Franklin. Near Cape Horn the vessels were separated by storm, and they did not again speak each other. Collinson wintered in 1850 at Hong Kong, in 1851 in Prince of Wales Strait, and in 1853 in Camden Bay. He arrived at Point Barrow in August of 1854. In 1858 he was awarded the gold medal of the Royal Geographical Society. He was appointed admiral on the retired list in 1875. He edited *The Three Voyages of Martin Frobisher in Search of a Passage to Cathaia* (1867), for the Hakluyt Society.

COLLISION. See IMPACT.

COLLISIONS OF VESSELS (from Lat. *collisio*, from *collidere*, to dash together, from *con-*, together + *ladere*, to dash). To prevent vessels running against one another in passing, there are 'rules of the road' (q.v.) at sea as well

as on land. In both the United States and Great Britain regulations are laid down which, though not having the force of law, are recognized by the admiralty courts, and govern the decisions in cases of collisions. In general, they are analogous to the rules observed by pedestrians in crowded thoroughfares, and by vehicles on highways. It is at night that the danger of collision is greatest; and hence the necessity for a well-arranged system of lights and other precautions. Of 3575 casualties of all kinds on and near the coasts of the United Kingdom in 1880-81, 713 were due to collisions; of these 69 resulted in total loss. The transatlantic steamers running between Queenstown, or the Channel ports, and New York have adopted the 'lane system,' first advocated by Lieutenant Maury, U. S. N., and afterwards developed by the Hydrographic Office, U. S. Navy, and approved by the Marine Conference held at Washington in 1889. This consists in the assignment of a definite lane or track to each separate line of steamships, along which route their vessels are required to maintain their course.

It has been held by American courts that, if a collision happens without fault, and no blame can be charged to those in charge of either vessel, each party must bear its own loss. In case both parties are at fault, neither can have relief at common law: but maritime courts aggregate the damage to both vessels and their cargoes, and divide the amount equally between the two. In case of inscrutable fault, that is, by a fault of those in charge of one or both vessels, and yet under such circumstances that it is impossible to learn who is at fault, the rule of equal division is also adopted. Where the fault is on the part of one vessel and no fault on the other, the owners of the vessel at fault must bear their own loss, and are also liable for the damage to the other vessel. In some cases the personal liability of owners is limited to the value of the vessel and freight. Strict laws, rules, signals, etc., are adopted by all nations to prevent collisions. (See NAVIGATION LAWS.) But, no matter how exacting may be the rules, cases will occur when their following would result in disaster. No vessel should unnecessarily incur the probability of collision by strict adherence to the rules. If it is clearly in the power of one vessel to avoid collision by departing from the rules, she will be held bound to do so; but a vessel is not required to depart from the rule when she cannot do so without danger. A proper lookout must be kept: the absence of such a lookout is in itself evidence of negligence. In some cases certain lights must be kept. Losses of a vessel injured by a collision are within the ordinary policy of insurance: but when the collision is the fault of the insured vessel, or of both vessels, the insurer is not ordinarily liable for injury done to the other vessel which may be decreed against the vessel insured, although recent policies provide that the insurer shall be liable in such case.

COLLO'DION (Neo-Lat., from Gk. κολλώδης, *kollōdēs*, glue-like, from κόλλα, *kolla*, glue + εἶδος, *eidos*, form). A solution of pyroxylin in a mixture of alcohol and ether. For its manufacture a convenient form of cellulose, such as cotton wool, is immersed in a mixture of nitric and sulphuric acid with a little water, or in a mixture of potassium nitrate with sulphuric

acid. The resulting product is washed in water and dried. The pyroxylin thus obtained is then treated with ether, to which alcohol is added until the substance is completely dissolved. The solution is a clear, colorless liquid that does not mix with water or alcohol, but readily mixes with ether; when exposed to the air it dries up, leaving a transparent film, which becomes electric by friction and may be exploded by heat, pressure, or percussion. Mixed with substances sensitive to light, collodion is extensively used in photography; the mixture is spread over a glass plate, on which it forms, when dried, a sensitive film. Collodion is also used in surgery, the tenacious and transparent film left by its evaporation preventing the access of air to the injured surface and protecting it from infection. Pills and other medicinal preparations may be coated with it so as to render them tasteless. Among the medicinal collodions that are official is *blistering* or *vesicating collodion*, which consists of cantharides dissolved in collodion: the solution is applied to the skin when it is desired to raise a blister. Wood, paper, and fabrics may be rendered waterproof by being covered with collodion. Small balloons are made from it by pouring a solution into a flask of the desired dimensions, which is then turned about so as to spread the liquid uniformly over the surface, and then inverted to allow the excess to run out. The solvent is then allowed to evaporate, and the edges of the remaining film are loosened from the glass by attaching a glass tube to the neck of the flask and withdrawing the air, whereupon the collodion balloon detaches itself, contracts, and is easily withdrawn. See also CELLULOSE.

COLLOIDS (from Gk. κόλλα, *kolla*, glue + εἶδος, *eidos*, form). A name applied by Graham to a group of substances, including ferric oxide, alumina, silicic acid, starch, dextrin, gum, albumin, gelatin, tannin, caramel, agar-agar, and others. These substances, though not by any means belonging to the same class chemically, behave alike in certain respects when obtained in solution in water or in some other solvent. In the first place, they diffuse, when dissolved, very much more slowly than most other substances ordinarily met with. In the second place, their presence in solution has scarcely any effect on the freezing-point or on the vapor-tension of the solvent, while most other substances have the effect of notably lowering both the freezing-point and the vapor-tension. Again, colloids often spontaneously deposit from their solutions in the form of gelatinous masses that cannot, in many cases, be re-dissolved and that usually retain mechanically a large amount of water. Such 'gelatinized solutions' are now used for a variety of purposes in the arts, advantage being taken of the mass being in a semi-solid condition, while the liquid retained by it may be used for the same purposes as when in the free state; such masses are used in photography by the 'dry' process, in making 'dry' electric batteries, in the manufacture of certain valuable explosives, etc. In scientific researches gelatinized solutions are now used for the purpose of studying the relative rates at which various substances diffuse in water. For this purpose it is important that the solutions should remain absolutely undisturbed for a considerable length of time, and this is accomplished best by

adding to them a certain amount of agar-agar or some other colloid, and causing them to 'gelatinize,' the 'dry' solutions thus obtained showing precisely the same rates of diffusion as ordinary aqueous solutions.

Another important property of colloids is their incapacity of traversing parchment paper and animal membranes. This permits of the separation of colloids from non-colloids (called 'crystalloids') without any difficulty; the process of separation being known as *dialysis*. Thus, to dialyze a solution containing common salt (a crystalloid) and silicic acid (a colloid), the solution may be placed in a bag of parchment paper and immersed in pure water: the salt will then readily pass through the paper, while the silicic acid will remain behind.

The properties of colloids are undoubtedly due to the comparatively very large size of their molecules. Thus, while the molecular weight of water is only 18, and that of most organic substances only a few hundred, the molecular weight of starch has been shown to be about 25,000, and that of silicic acid is at least 50,000.

COLLOPH'ANITE (from Gk. κόλλα, *kolla*, glue + φαίνω, *phainō*, to show). Amorphous hydrated calcium phosphate. It has a banded structure, resembling opal, and a conchoidal fracture. In color it is snow-white or yellowish-white. This mineral is found chiefly on the island of Sombbrero, having been formed in the elevated coral reef by infiltration of salts from the overlying guano.

COLLOP MONDAY. An old English term used to designate the Monday before Lent, from the custom of those days (when fasting was much stricter than at present) of cutting meat into strips or collups and salting it to keep until Lent was over.

COLLOT D'HERBOIS, kô'lô' dâr'bwâ'. JEAN MARIE (1750-96). A French Revolutionist. He was born in Paris, and passed his early life as an actor. After visiting Holland and acting as the director of a troupe at Geneva, d'Herbois took to play-writing. Most of his productions were adaptations from English and Spanish, and one, *Le paysan magistrat* (1777), was popular for a time. In 1789 d'Herbois, who was then living in Paris, wrote *La famille patriote ou la fédération*, a revolutionary drama, and followed up this success by bringing out the *Almanach du Père Gérard*, for which he was awarded a prize by the Jacobin Club. Elected as the third deputy from Paris to the Convention in 1792, he became, in the following year, president of that body, and a member of the Committee of Public Safety. In November, 1793, he was sent to Lyons to complete the work of pacification begun by Couthon. There he showed himself merciless in the service of the Republic, and caused 1600 persons to be put to death. On returning to Paris he found himself, owing to his popularity, an object of suspicion to Robespierre, and, after an attempt to assassinate him had failed, Robespierre's jealousy increased. Collot d'Herbois took part in the conspiracy which led to Robespierre's downfall, but the reaction was fatal to himself. He was expelled from the National Convention, and in April, 1795, was sentenced to deportation to Cayenne, where he died of fever, January 8, 1796. Consult: Anlard, *Les orateurs de la Législative et de la Convention*

(Paris, 1885-86); Morse-Stephens, *The French Revolution* (London, 1891), and *Statesmen and Orators of the French Revolution* (Oxford, 1892).

COLLUSION (Lat. *collusio*, from *colludere*: to defraud, to play together, from *con-*, together + *ludere*, to play). In law, a species of fraud (q.v.), and consisting in an agreement between two or more persons to defraud a third, or to accomplish some illegal purpose; thus, it is collusion for a failing debtor to transfer property to another, who receives it to enable him to defraud some or all of his creditors; or for husband and wife, by mutual agreement or understanding, to institute a suit to procure a divorce without legal cause. Such transactions or proceedings are voidable because of their fraudulent character.

COLLU'THUS (Lat., from Gk. Κόλλουθος, *Kollouthos*). A Greek poet of the fifth century; a native of Lycopolis in Upper Egypt. He is believed to have been the author of a poem in 392 verses, entitled, 'Ἑλένης Ἀρπαγή, *Helenēs Harpalē*, or the *Rape of Helen*, which was discovered by Cardinal Bessarion, in Calabria. The text has been edited by Lehrs. in the Didot collection (1841). No other of his poems is extant.

COLL'YER, ROBERT (1823—). An American clergyman of the Unitarian Church. He was born at Keighley, Yorkshire, England; at eight years of age he was a mill-hand; at fourteen, a blacksmith; and in 1849 became a local preacher of the Methodist Church. In 1850 he came to America and began work as a hammer-maker, at Shoemakertown, Pa. At the same time he continued to officiate as a local preacher. In 1859 he formally joined the Unitarian Church, in the same year went to Chicago as a missionary of that denomination, and shortly after organized and became pastor of Unity Church. He was called in 1879 to assume charge of the Church of the Messiah, New York City, of which, after a long and successful active pastorate, he became senior associate minister. His publications include two volumes of sermons, *Nature and Life* (1865; 11th ed., 1882) and *The Life that Now Is* (1871; 10th ed., 1882), written in a style noteworthy for its effective use of an Anglo-Saxon vocabulary. *The Single Truth* (1877), *History of Ilkley* (1883; with Horsefall Turner), and *Things New and Old* (1893), may also be mentioned.

COLMAN, kôl'man, BENJAMIN (1673-1747). An American Congregational clergyman, prominent in the Colonial period. He was born in Boston, graduated at Harvard in 1692, preached and studied theology for three years, and spent the years 1695-99 in England. After his return he became first pastor of the newly organized Brattle Street Church, a position which he filled until his death. He exercised a great influence both in religious and secular affairs, and, in spite of his slightly heterodox views, was widely popular as a preacher. In 1724 he refused the presidency of Harvard College. Besides a collection of sermons, in three volumes (1707-22), he published a number of poems and a pamphlet advocating inoculation for the smallpox. Consult Turell, *Life and Character of Benjamin Colman* (Boston, 1749).

COLMAN, GEORGE, called THE ELDER (1732-94.) An English dramatic author and theatrical

manager. He was born in Florence, was educated at Oxford, and was called to the bar in 1755, but soon abandoned law for literature. In 1760 his first dramatic piece, entitled *Polly Honeycomb*, was produced at Drury Lane with great success. This comedy was followed the next year with *The Jealous Wife*, and in 1766 with *The Clandestine Marriage*, written in conjunction with Garrick. In 1767 he became one of the purchasers of the Covent Garden Theatre, and held the office of acting manager for seven years. In 1777 he purchased the Haymarket Theatre. Colman wrote and adapted upward of thirty dramatic pieces. He also translated Terence, edited Beaumont and Fletcher, and wrote considerable other verse and prose. Consult Peake, *Memoirs of the Colman Family* (London, 1841).

COLMAN, GEORGE, called **THE YOUNGER** (1762-1836.) An English dramatist, son of George Colman. His bent lay in the same direction as his father's, during whose last years he acted as manager of the Haymarket Theatre, and on the death of the elder Colman George III. transferred the patent to his son. After 1824 Colman held the office of examiner of plays. In industry he rivaled his father, and he received large sums for his plays, of which the best known are *John Bull* and *The Heir-at-Law*. He wrote many humorous verses, among which were *Broad Grins* (1802) and *Poetical Vagaries* (1812). In 1830 he published an amusing autobiography, *Random Recollections*.

COLMAN, NORMAN J. (1827—). The first Secretary of Agriculture of the United States. He was born on a farm near Richfield Springs, N. Y., May 16, 1827. In 1847 he removed to Louisville, Ky., and he afterwards practiced law in New Albany, Ind., and in Saint Louis, Mo. He served in the Union army during the Civil War as lieutenant-colonel of volunteers. In 1874 he was elected Lieutenant-Governor of Missouri, and in 1885 was appointed United States Commissioner of Agriculture. Toward the end of his term he was appointed Secretary of Agriculture, under the law reorganizing the Department of Agriculture.

COLMAN, SAMUEL (1832—). An American landscape painter. He was born in Portland, Maine, and studied first in New York and later in France, Italy, and London. After traveling extensively, he returned to New York and was one of the founders of the American Water Color Society, and its first president (1866-71). As an artist, Colman is noted for American and foreign landscapes in oil and water colors, and for vigorous etchings.

COLMAR'. See **KOLMAR**.

COLNE, kōln. A market town of Lancashire, England, on the Colne, near the Leeds and Liverpool Canal, 32 miles north of Manchester, at the junction of the Lancashire and Yorkshire and Midland railways (Map: England, D 3). Colne was incorporated in 1895, but long before had obtained control of its gas and water supply. It has established an excellent modern system of sewage disposal, and maintains a public library, markets, and slaughter-houses. It has manufactures of cotton, calicoes; and mousselines-delaïne. There are also numerous collieries and stone-quarries in the vicinity. Population, in

1891, 16,800; in 1901, 23,000. Colne is an ancient place, by some supposed to be the *Colunio* of the Romans.

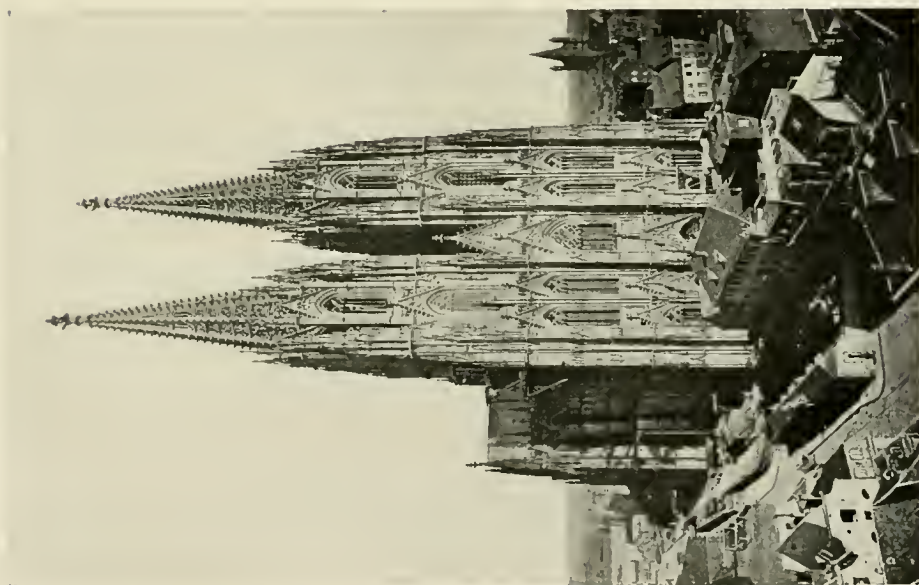
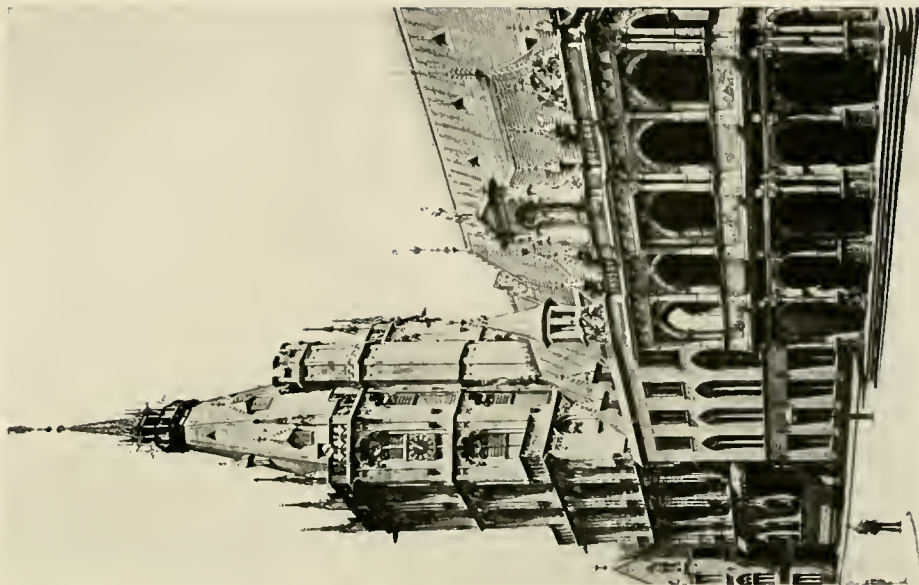
COL'OCA'SIA. See **Cocco**.

CO'LOCO'LO. A wildcat of South America, related to the ocelot (q.v.).

CO'LOCCTRO'NIS. See **KOLOKOTRONIS**.

CO'LOCYNTH (OF. *coloquinte*, from Lat. *colocynthis*, from Gk. *κολοκύνθις*, *kolokynthis*, *colocynth*, from *κολοκύνθη*, *kolokynthē*, pumpkin), or **BITTER APPLE**. A well-known medicine, much used as a purgative. It is the dried pulp of the colocynth gourd, *colquintida*, bitter apple, or bitter cucumber, a globose fruit about the size of an orange, of a uniform yellow color, with a smooth, thin, solid rind. The plant which produces it, *Citrullus colocynthis*, is allied to the cucumber (q.v.). It is common in Turkey, the Grecian Archipelago, various parts of Asia, and in Africa and Spain, which last country supplies no small part of the colocynth of commerce. The fruit is gathered when it begins to turn yellow, peeled, and dried quickly either in a stove or in the sun. It is chiefly in the form of a dry extract that it is used in medicine. It owes its properties to a bitter principle called *colocynthin*, a glucoside. It is a curious, though not unique, fact that the seeds of the colocynth-plant, produced in the midst of its medicinal pulp, are perfectly bland, and they even form an important article of food in the north of Africa. The name false colocynth is sometimes given to the orange gourd (*Cucurbita aurantia*), sometimes cultivated as an ornamental plant in our gardens, on account of its globose, deep orange fruit. The pulp of the fruit possesses the properties of colocynth, but in a milder degree. Colocynth is generally administered in the form of pills, in which the extract is associated with aloes, scammony, and in some cases with calomel, or with extract of hyoscyamus. In small doses colocynth acts as a safe and useful purgative; and, when accompanied by hyoscyamus, the latter prevents much of the pain and griping which are attendant on the use of colocynth by itself. It is a drastic purgative, acting upon the whole intestine, and is used only in obstinate cases of chronic constipation. Colocynth is an ingredient of some powders for destroying moths. In large doses colocynth is a poison, causing severe inflammation of the stomach and intestine. The medicinal dose of colocynth is from 2 to 8 grains; that of the official extract of colocynth, from ½ to 2 grains; that of the compound extract of colocynth, from 5 to 15 grains. It is sometimes administered in the form of pills.

COLOGNE, kō-lōn' (Ger. *Köln*; the *Colonia Agrippina* of the Romans). The largest city of Rhenish Prussia, on the left bank of the Rhine, in latitude 50° 56' N., longitude 6° 58' E. (Map: Prussia, B 3). Cologne is a fortress of the first rank, its fortifications forming a semicircle, with the Rhine as its chord, and the former town of Deutz (now included in Cologne) on the opposite bank, as a tête-de-pont. It is connected with this suburb by a bridge of boats and a fine iron bridge 1362 feet in length, for railway and carriage traffic. In the old quarter the streets are narrow and crooked, but the main residential quarter presents a thoroughly modern aspect.



COLOGNE
CATHEDRAL RATHAUS

The Ringstrasse, a stately boulevard four miles long, occupies the site of the ancient walls, dismantled in 1881-85. A new line of fortifications established beyond the Ringstrasse covers 1000 acres, and has doubled the city's area.

Among the public buildings the churches claim the greatest share of attention, the splendid specimens of the Romanesque period being more numerous than in any other city in the world. The oldest is the Church of Saint Gereon, said to have been founded by the Empress Helena; the choir, with its two square towers, was added in the eleventh century, and the decagonal nave dates from 1219-27. Saint Maria im Capitol, consecrated in 1409, is a cruciform basilica of imposing appearance. The interior is decorated with fine frescoes. The Apostles' Church, a remarkably fine basilica, presents the best specimen of the highly developed style of architecture, in which the ecclesiastical enthusiasm and civic love of splendor found expression toward the end of the twelfth century; and the Church of Saint Cunibert, dating from the middle of the thirteenth century, is a prominent example of the transition style. The Church of Gross Saint Martin was consecrated in 1172; its massive eastern portion has an imposing tower, 270 feet high. The Jesuits' Church, erected in 1618-29, may be mentioned as an excellent specimen of the mingled style peculiar to that order. The Church of Saint Peter is celebrated for the altar-piece of the crucifixion of Saint Peter by Rubens, and that of the Minorites for containing the tomb of the famous scholastic Duns Scotus. Saint Ursula is another church of historic interest. Most of these edifices underwent complete restoration during the nineteenth century.

The chief object of interest in the city, however, as well as its greatest ornament, is the cathedral, the noblest specimen of Gothic architecture in Europe. It is said to have had its origin in a structure erected at the beginning of the ninth century, by Archbishop Hildebold. This was burned in 1248, and the present cathedral was begun in the same year. The choir, the first part completed, was consecrated in 1322. The work was carried on, sometimes more actively, sometimes more slowly, till the era of the Reformation, when it was suspended, and, during the subsequent centuries, not only was nothing done to advance it, but the uncompleted structure was suffered to decay. In the beginning of the nineteenth century, however, attention was attracted to its unrivaled beauties, and it became the subject of an enthusiasm extending over all Germany, giving birth to a multitude of associations for the supply of the necessary funds to repair and complete it according to the original designs. Funds were also forthcoming from other parts of Europe. On September 4, 1842, the King of Prussia, who had contributed largely to the funds, laid the foundation stone of the transept, from which time great progress was made. The naves, aisles and transepts were opened in 1848. The magnificent south portal was completed in 1859, and in 1860 the iron central spire was added. With the exception of the towers, the whole was finally completed in October, 1863. The towers were finished in 1880, and on the 15th of October the completion of this grand work was celebrated with great splendor in the presence of Emperor William I. and most of the sovereign princes of the German Empire. The

cathedral has a length of 443 feet and a width of 200 feet; the height of the roof is 201 feet, that of the central tower over the crossing 357 feet, and of the two main towers 512 feet.

The most noteworthy secular edifices are: the Rathaus, the central and oldest portion of which dates from the fourteenth century and contains the handsomely restored Hansa Saal, in which the first general meeting of the Hanseatic League was held in 1367. The graceful portico in Renaissance style, and the splendid five-storied tower, deserve attention. South of the Rathaus rises the imposing structure of the Gürzenich, erected in 1441-52 as a festive hall for the entertainment of distinguished guests by the City Council, and first used for that purpose at the grand festival held in honor of Emperor Frederick III. in 1475. Thoroughly renovated in 1856, it is now the most splendid among the old secular structures, and since 1875 was used as the Stock Exchange. The Templars' Lodge, once the residence of the Overstolzen, a distinguished family of mediæval Cologne, is a fine Romanesque building of the twelfth or thirteenth century, now used by the Chamber of Commerce. Of the numerous modern public buildings the most prominent are: the palatial Government buildings (1830); the Municipal Museum (1855-61); the Stadttheater (1872); the Court of Justice (1886-93), an extensive Renaissance structure, with an impressive façade and handsome staircase; the imposing new Post-Office (1893); and the Reichsbank (1897).

Cologne is administered by an *Oberbürgermeister*, appointed for a period of twelve years and assisted by twelve assessors. The municipality operates successfully its own gas and water works, as well as an electric-lighting plant. The street railways are operated by a private company, whose franchise expires in 1916, when the lines will be turned over to the municipality without compensation. The municipality also owns and maintains a pawnshop and slaughter-houses. The educational establishments of Cologne include three gymnasia, one *oberrealschule*, a theological and a teachers' seminary, and a conservatory of music, supported by the municipality. The municipal library contains 115,000 volumes, and the museum has a number of valuable collections. Cologne has a fine municipal theatre. The zoological garden is one of the finest in Europe. The industries of Cologne are extensive and varied. The industrial establishments include sugar refineries, tanneries, machine-shops, paper-mills, flour-mills, breweries, distilleries, and several factories producing the celebrated eau de Cologne. The commerce, both by rail and by Rhine steamboats, is very great. A fine modern harbor, with extensive quays, has been constructed since 1897. The population of Cologne has greatly increased since 1888, when outlying districts began to be annexed to the city. In that year the population numbered 144,772; it rose to 281,681 in 1890, and 372,229 in 1900.

Cologne was originally a town of the German tribe of the Ubii (*Oppidum Ubiorum*). It received the name of Colonia Agrippina, A.D. 50, when Agrippina, the wife of the Emperor Claudius, planted a colony of Roman veterans on the spot, which was her native place. It grew to be an important city under the Romans, and retained its prominence under the Frankish sway. The

Bishopric of Cologne, instituted in Roman times, was elevated to the rank of an archiepiscopal see by Charles the Great in 785. At this time the city was a busy seat of commerce. It entered the league of the Hansa towns in the beginning of the thirteenth century, and contended with Lübeck for the first rank. The archbishops acquired considerable territory, and some of them distinguished themselves as politicians and warriors. They took their places among the great princes and electors of the Empire, but were involved in a protracted contest with the citizens of Cologne, who successfully asserted against them the independence of the city. Within the city a bitter contest was carried on all through the Middle Ages between the small number of merchant princes and the trade guilds. The Reformation made little progress in Cologne, and the Protestants were treated with intolerance. With the sixteenth century began a process of steady decline, which remained unchecked till after the end of the Napoleonic wars, when a new period of industrial prosperity set in. In the course of the wars of the Revolution the city lost its independence, to become part of France, and on the downfall of Napoleon it was annexed to Prussia. The archbishopric was secularized in 1801-03, and the Congress of Vienna assigned all of its territories to Prussia. A new archiepiscopal see was created in 1824. Consult: Heldmann, *Der Kölngau und die Civitas Köln* (Halle, 1900); Paget, "Cologne, the Rome of the Rhine," in 116: 235, *Temple Bar* (London, 1899).

COLOGNE, EAU DE. See EAU DE COLOGNE.

COLOGNE, THE THREE KINGS OF. The three wise men, or magi, by name Melchior, Kaspar, and Balthazar, who followed the star from the East to where it rested above the new-born Jesus. Their bones are said to have been placed in Cologne Cathedral, and their skulls were exhibited there as late as the eighteenth century. Those who touched them were supposed to be healed of their diseases. The names of the three kings were also used as a charm.

"Ye three holy Kings,
Kaspar, Melchior, and Balthazar,
Pray for us now, and in the hour of death,"

was written on a paper found on the body of a dead murderer at Chichester, England, in 1749.

COLOGNE YELLOW. A yellow pigment made by precipitating a mixture of lead and calcium nitrates with sodium sulphate and potassium chromate. It is essentially a chrome yellow in which the intensity of the color is lessened by the calcium salt.

COLOM'BA. A story of Corsica, by Prosper Mérimée (1840). It is considered his masterpiece.

COLOMBAT DE L'ISÈRE, kó'lón'bá' de lé'zár' (1798-1851). A French physician, born at Vienne, Department of Isère. He devoted himself to the study of defects of speech and established in Paris an institute for the correction of stuttering, on the principle of rhythmic pronunciation. His best-known work, entitled, *Traité de tous les vices de la parole et en particulier du bégaiement* (1830), passed through several editions. In recognition of his fruitful services, the Academy of Sciences awarded him a prize of 50,000 francs.

COLOMBES, kó'lón'bé'. A town in the Department of Seine, France, suburban to Paris, three

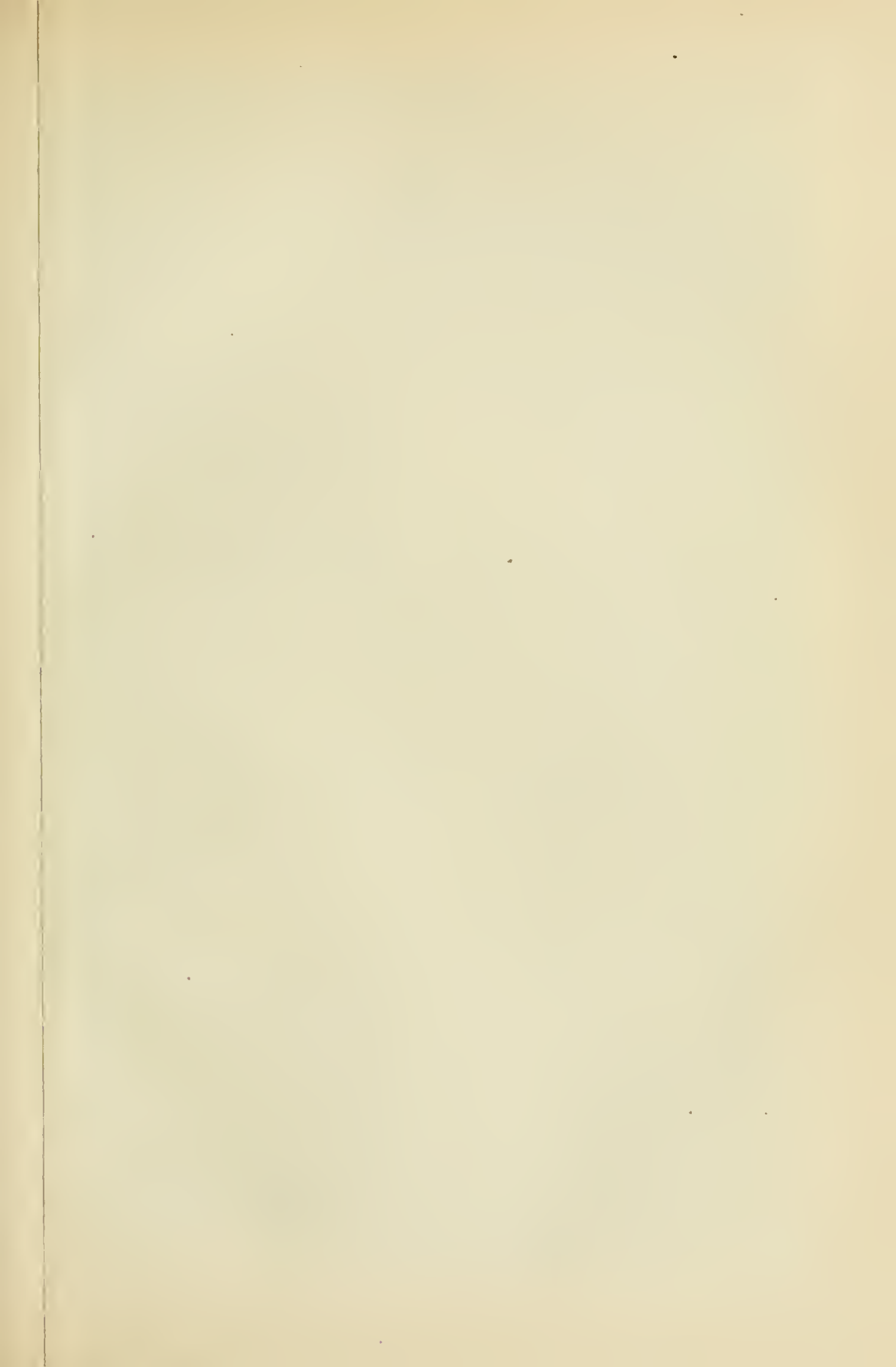
miles northwest of the city-walls. It has manufactures of starch, gelatin, and woollens; there are also petroleum-refineries, etc. Population, in 1901, 23,061.

COLOM'BIA (so called in honor of Christopher Columbus). A republic in South America, occupying the northwest corner of the continent and bounded by the Caribbean Sea and Venezuela on the north, Venezuela and Brazil on the east, Ecuador on the south, and the Pacific and Costa Rica on the west. It lies between latitudes 3° S. and 12° 30' N., and between longitudes 67° 30' and 83° W. The area is variously estimated at from 463,000 to 513,000 square miles. It is the only South American country bordering on both oceans.

TOPOGRAPHY. The bulk of Colombia may be divided into two physiographic regions, the Andean Cordilleras, and the great plains or llanos of the east. The highlands of Panama and Darien are only indirectly connected with the Andes. Entering Colombia from Ecuador, the Cordilleras are continued in a general northerly direction by three diverging ranges, which spread out over the entire western section of the country. The Western Cordillera constitutes a long mountain ridge, with summits 10,000 to 11,000 feet in altitude, which is defined on the east by the valley of the Cauca River. In the northern part the chain is flanked on the west by the Cordillera del Chocó. The Central Cordillera, the continuation of the Eastern Cordillera of Ecuador, contains the highest peaks in Colombia, including the volcanoes Huila, Puracé, and Tolima, the last reaching an altitude of over 18,000 feet. The Eastern Cordillera, separated from the central range by the Magdalena River, attains an extreme elevation of about 16,000 feet, and has great table-lands that are the most thickly populated regions in the Republic. This chain divides at the north, the eastern range extending into Venezuela, and the western, known as the Sierra de Perijá, running northward and merging into the Sierra Nevada de Santa Marta, near the coast. There are a number of high passes, among which is the famous Inca or Quindia Pass, across the Central Cordillera, 11,500 feet. The llanos east of the Cordilleras have a surface tilted toward the Atlantic. Here there are great stretches of nearly level ground, covered with luxuriant growths of grasses in the north and heavily forested in the south.

Colombia has a coast line of over 3600 miles, of which more than 1600 miles are on the Pacific. The shores are very irregular and form a number of good harbors both on the west and north. Notwithstanding the mountainous surface, the region abounds in long navigable rivers. The Magdalena traverses the country northward through almost its entire length, and receives numerous tributaries, the Cauca being the most important. The Atrato also flows north not far from the west coast and enters the Gulf of Darien. The eastern plain belonging to the basins of the Orinoco (which forms part of the eastern boundary) and the Amazon is crossed by many long rivers. The chief affluents of the Orinoco are the Guaviare and the Meta; of the Amazon, the Uaupés, and the Japurá (or Caquetá).

The climate is of extraordinary variety. In the Cordilleras it is moderate in the upper regions, but very hot in the valleys. Along the valley of





ude F West 55° from G Greenwich 50° H 45° J 40° K

BOLIVIA, BRAZIL, COLOMBIA, ECUADOR, GUIANA, PERU AND VENEZUELA.

SCALE OF ENGLISH STATUTE MILES.

0 50 100 200 300 400 500 600 700

APPROXIMATELY 820 MILES TO ONE INCH.

KILOMETERS.

0 50 100 200 300 400 500 600 700 800

Capitals of Countries : ⊙

Railroads : —

Capitals of States, Provinces, Departments and Territories : ⊙

Telegraph Lines : —



F 55° G 60° H 40° J 35° K L

the Magdalena the thermometer is frequently above 100°. The llanos have an exceedingly hot climate, while on the Pacific coast the temperature is greatly modified by sea-breezes. On the table-lands of the Cordilleras the mercury occasionally falls as low as 44°. In the mountainous parts there are two rainy seasons: on the coast, rains occur at any time of the year. Generally speaking, the country is healthful.

FLORA. The variety of climatic conditions and the very irregular formation of the surface naturally produce a varied flora. In the lower regions plant life is purely tropical and includes the common plants of South America. The palms are very numerous, and include the lofty wax-palm (*Ceroxylon Andicola*). Of the more useful forest trees of this region is the rubber (*Castilloa elastica*). The mountain slopes are mostly clothed with thick forests, the timber-line being above 10,000 feet. Cinchona-trees of several species are found between 7000 and 9000 feet above the sea, and the aloe, the sarsaparilla, and other medicinal plants grow in abundance. Cacao, coffee, sugar, and indigo are largely cultivated.

FAUNA. The fauna is also of great variety, and includes the larger South American mammalian types, such as the jaguar, puma, tapir, ant-eater, sloth, several species of monkey, and one or more species of red deer (on the plateaus). The condor, vulture, numerous toucans and parrots, and a variety of humming-birds (some of them confined to the snowy regions of the volcanoes) are a part of the rich avifauna. Serpents of several kinds are found in the torrid regions; the venomous forms are rarely found above 6000 feet.

GEOLOGY. The mountain regions here have long been the seat of great volcanic activity. The chief formations in the central range are granite, gneiss, basalt, and eruptive rocks, while in the eastern range Cretaceous formations predominate. The geological structure of the Western Cordillera has not yet been fully investigated. The entire portion east of the Cordilleras is occupied by the llanos—vast treeless plains having an altitude of from 1000 to 1500 feet, and well adapted for pasturing. The isthmus section is partly hilly and partly low and swampy.

MINERAL RESOURCES. Colombia is very rich in minerals, especially in precious metals. Gold is found mostly in alluvial deposits and in the streams. During the Spanish régime the proceeds from the gold-mines constituted the chief revenue; but the extracting was carried on by most primitive means. Modern methods were introduced only during the last quarter of the nineteenth century, though the principal mines have long been operated by English companies. The chief centre of gold-mining is Antioquia, which yields about \$200,000 per annum. The leading silver-mines are in Tolima and Cauca. The annual silver output of the country amounts to nearly \$4,000,000. The other mineral resources—iron, copper, platinum, lead, and salt—are little developed. Emeralds are mined chiefly in the Department of Santander, the mines of Muzo being the most noteworthy. Salt-mining, a Government monopoly, is carried on chiefly around Zipaquirá and Nemocón, where salt is found both in rock form and in springs. Coal exists in the Eastern Cordillera and in many other parts, but is as yet scarcely touched.

AGRICULTURE. The principal industry of Colombia is agriculture, which is greatly favored by the soil and climate, but is carried on by primitive methods. Cultivation is confined mainly to the elevated plateau of the western part. These sections are best adapted to settlement by European immigrants, on account of the salubrious climate. In the hot districts the chief plants are coffee, tobacco, sugar, cacao, etc. Tobacco, and especially coffee, are largely exported. In the less torrid regions the agriculture is more European in character, wheat, corn, and barley being leading crops. The banana-tree is found all over the Republic, and the fruit is exported in large quantities, mostly to the United States. The absence of adequate transportation facilities and the sparseness of population are such hindrances to agriculture that the total yield of the food crops is not sufficient to satisfy the home demand, and the deficiency has to be made up by imports. The rubber-tree and the copaiba-tree grow wild and are tapped but not cultivated. The uplands are the home of the tolu, well known for its balsam. Cattle-raising is conducted on a considerable scale, especially on the llanos. In 1901 the number of cattle in the Republic was estimated at 3,450,000. Both cattle and hides form prominent items of export.

MANUFACTURES. The manufacturing industries are insignificant. The Indians make pottery, cotton fabrics, and straw matting, as well as the famous 'Panama' hats. The sugar-mills are of the most primitive kind. The industry of wood-carving and horn-carving, once well developed among the aboriginal population, is gradually dying out. The distilling of liquor from sugar is a Government monopoly.

TRANSPORTATION AND COMMUNICATION. Owing to its mountainous surface, Colombia is very deficient in roads. Communication is mostly maintained by means of narrow paths accessible only to pack-mules, and even the principal roads are usually in an almost impassable condition. The lack of good roads is partly remedied by the navigable waterways. The Magdalena chiefly, and the Atrato, Cauca, and a number of minor streams, are utilized for transportation, while through the river Meta communication is had with the Orinoco. The construction of railways in the Republic has been very slow and irregular. There were in 1901 about 400 miles in operation. The most important line is the Panama-Colón (48 miles), owned by an American corporation. Other lines are also operated by American companies. Some are managed by the States with the assistance of the Central Government. These short lines—ranging from 25 to 100 miles in length, and scattered all over the country—have little influence on the general economic conditions of the Republic. There are a number of new lines and extensions surveyed and projected, but they will hardly be built until the political conditions become more stable. There are nearly 9000 miles of telegraph line. About 1000 vessels of 1,300,000 tons annually enter and clear the ports. The Republic is in regular communication with Europe and the United States by means of ten lines of mail steamers.

COMMERCE. The commerce of Colombia, like its industries, is hindered by lack of transportation facilities, the frequency of political disturbances, and the heavy export and import

duties. Chief exports are coffee, gold bars and dust, cattle, hides, tobacco, silver ore and bars, food articles, etc. Chief imports are salt, petroleum, flour, cottons, wine, iron and steel wares, drugs and chemicals. From 1894 to 1898 the value of the imports fluctuated from 10,711,207 to 19,722,098 gold pesos; the exports, from 15,088,406 to 19,157,788—the largest total volume of trade being in 1897. Owing to the civil war, the only trade statistics accessible for 1899 and 1900 are those for the port of Barranquilla. Of the exports, it is estimated that about 27 per cent. in value goes to the United States; 25 per cent. to Great Britain; 17 per cent. to France; 16 per cent. to Germany. The trade of the United States with Colombia since 1860 has been as follows: the average for the decade of 1860-70, \$836,000; 1870-80, \$6,110,800; 1880-90, \$4,036,000; and 1890-1900, \$3,684,000. The commerce between Colombia and the other South American countries, excepting Venezuela, is insignificant. The inland trade, owing to the great variety in the products of the different portions of the Republic, is active, and carried on chiefly by means of weekly markets. The transit trade through the ports of Panama and Colón, east and west, is considerable, the largest item representing goods bound for New York.

GOVERNMENT. Colombia has practically had a republican form of government since 1819. The present Colombian Constitution (the seventh since 1821) dates from 1886, and, in contrast with the preceding instruments, which recognized the sovereignty of the constituent States, it provides for a very strong centralization of power.

Administration.—The President, according to the Constitution, is elected indirectly for a period of six years, and is assisted by six ministers, who are theoretically responsible to the Senate. There is a State Council of six members. The legislative power is vested in Congress, consisting of the Senate and the House of Representatives. In the former each of the nine departments is represented by three Senators, elected for a period of six years; while in the latter (sixty-six members) the departments are represented at the rate of one member (elected for four years) for every 50,000 inhabitants. Both Senators and members of the House of Representatives are elected indirectly by voters restricted by an educational and property qualification. The departments, except Panama, which is ruled directly by the National Government, are administered by governors appointed by the President and removable at his pleasure. The departments have councils elected by the people at the rate of one member for every 25,000 inhabitants, and are divided into provinces presided over by prefects appointed by the Governor. For the administration of justice, there are a Supreme Court of seven judges, appointed by the President with the consent of the Senate, district supreme courts, and provincial courts. Military service is obligatory in time of war, while in time of peace the army is recruited by lot, but substitutes are admitted. The size of the army in time of peace is regulated by Congress, and was fixed at 1000 in 1898.

Finance.—The finances of the Republic have always been in a deplorable condition. The public debt has constantly increased. The consoli-

dated and floating internal obligations amounted in 1899 to 11,359,071 pesos. The external debt, held chiefly in Great Britain, amounted in 1896, with arrears, to £3,514,442 (\$17,080,188). By an arrangement with the bondholders in 1897, the Government was able to cut the external debt down to £2,700,000 (\$13,122,000), and new bonds were issued to that amount at 1½ per cent. interest, the rate to be gradually increased to 3 per cent. This programme was satisfactorily carried out until the civil troubles of 1899. By the middle of 1901 the arrears of interest amounted to about \$500,000. The revenue is derived chiefly from the import and export duties, and from monopolies (salt, liquors, cigars, and meat). The budget is estimated for two years, and fluctuates as a rule from 30,000,000 to 40,000,000 paper pesos. The revenue for 1901-02 was estimated at about 29,000,000 paper pesos, as against expenditures of over 40,000,000. The departments are independent in their internal financial affairs, and derive their revenues chiefly from monopolies. The currency of the country consists of depreciated paper pesos, of which there are about 40,000,000 in circulation. In 1894 a provision was made for their redemption by the free coinage of gold, but the scheme proved unsuccessful and gold is at a high premium.

POPULATION. No census of the population has been taken since 1870, when the inhabitants numbered 2,951,323. According to an official estimate in 1881, the number was 3,878,600. At the close of the century it was supposed to exceed 4,000,000, or about eight inhabitants per square mile. The language and civilization are Spanish; the assimilation of the aborigines, with the exception of those in the more secluded parts of the country, has been complete. Capital, Bogotá (q.v.). The following is a list of the departments:

	Area, English Square miles	Population 1881
Antioquia.....	22,316	470,000
Bolívar.....	21,345	280,000
Boyacá.....	33,351	702,000
Cauca.....	257,462	621,000
Cundinamarca.....	79,810	569,000
Magdalena.....	24,440	90,000
Panama.....	31,571	285,000
Santander.....	16,400	555,600
Tolima.....	18,069	306,000
Total.....	504,773	3,878,600

EDUCATION AND RELIGION. Education is free, but not compulsory, and is to a large extent maintained by the State. Besides the university at Bogotá, there are a national institute for working people, a school of arts and trades, and a national school of music. The secondary schools are mostly in the hands of the Roman Catholics. Altogether there were, in 1897, over 2000 public educational institutions, with an attendance of nearly 150,000, or about 4 per cent. of the population. Religious toleration and free speech are guaranteed by the Constitution; but the Roman Catholic Church, to which most of the inhabitants belong, is recognized as the national Church.

HISTORY. The northern coasts of Colombia were visited by Ojeda and Vespucci in 1499. Three years later Columbus explored a section

of the country, and attempted to found the first Spanish colony on the American mainland. Between 1511 and 1517, Balboa and Pedrarias explored and settled both coasts of the Isthmus. As early as 1515 Pizarro and Gaspar de Morales had explored the Pacific coast as far south as 'Biru,' a term from which the present territory of Peru gets its name, although lying considerably beyond Pizarro's 'Biru.' Between 1536 and 1540, Ximenes de Quesada conquered the Chibchas, or Muyscas, the principal nation, and the country became thoroughly settled as a dependency of Spain. It was known as the Province of New Granada till 1718, when it was made a viceroyalty. In common with the other Spanish possessions, it rose in revolt in 1810, and in 1819 became independent, joining with Venezuela (1819) and Ecuador (1822) to form the Republic of Colombia. This union was dissolved in 1829-30, and New Granada was founded as a separate republic in 1831. After several changes in the Constitution (in 1843, 1851, and 1853), a new Constitution was adopted in 1858, by which the separate 'Provinces' were changed into 'States,' associated under a federal government, known as 'Confederación Granadina,' and similar to that of the United States of North America. The States were made self-governing in all internal affairs. In 1860 another revolution broke out, and for more than two years the country was devastated by civil war. Finally, in 1863, the nine States again agreed upon a Constitution, organizing themselves under the name of United States of Colombia. Another revolution, begun in 1884, was terminated in 1886 by the promulgation of a new Constitution, which transformed the loose federal union into a strongly centralized State. A rebellion in 1895 was promptly suppressed. In 1899 the insurrectionary elements reappeared, but were suppressed before they had gathered headway. A year later there was a more formidable outbreak, with severe fighting at Panama. The insurrection was due in great measure to a general feeling of discontent aroused by the corrupt conduct of the Conservative Party, which was then in power. In August, 1900, the Vice-President, Marroquin, made himself master of the Government, and carried on an energetic campaign against the Liberals. During 1901 it was supposed, with good reason, that the rebels were receiving aid from Venezuela and Ecuador, where the Liberal elements were in power, and were aiming at the overthrow of the Conservative Party and the ultimate restoration of the old Republic of Colombia, embracing the present commonwealths of Colombia, Venezuela, and Ecuador. Severe fighting occurred around Panama in 1901 and 1902.

Consult: Perez, *Geografía general física y política de los Estados Unidos de Colombia* (Bogotá, 1886); Velasco, *Nueva geografía de Colombia* (ib. 1892); Child, *The Spanish-American Republics* (New York, 1891); Nuñez and Jalhay, *La république de Colombie: Géographie, histoire, organisation, etc.* (Brussels, 1893); Regel, *Kolumbien* (Berlin, 1899); Seruggs, *The Colombian and Venezuelan Republics* (New York, 1900); Restrepo, *Gold and Silver Mines of Colombia* (ib. 1886); Wheeler, *The Agricultural Condition of Colombia* (London, 1889); Röthlisberger, *El Dorado: Reise- und Kulturbilder aus dem südamerikanischen Kolumbien* (Berne, 1897).

The standard work on the history of Colombia is Pereira, *Les Etats-Unis de Colombie* (Paris, 1883). There are numerous narratives of events of the war against Spain, written by English officers serving with the Revolutionists, of which the best are, perhaps: Hall, *Present State of Colombia* (London, 1825), and the anonymous *Recollections of a Service in Venezuela and Colombia* (London, 1828).

COLOMBO, kô-lôm'bô. The capital and chief seaport of Ceylon, situated on the western coast of the island, on a rocky headland, in latitude 6° 54' N. and longitude 79° 51' E. (Map: India, C 7). The European part of the city is magnificently laid out, with broad avenues shaded by tropical trees and lined by modern buildings of fine architecture. The business part of the European city occupies the site of an old Dutch fort, and is still known as the 'Fort.' Its chief thoroughfare is Queen Street, on which are situated the palace of the Governor, the chief mercantile houses and banks, and the post-office, the finest public building on the island. The residential section of the European city covers an area of about 20 square miles. The part nearest to the water is occupied by numerous clubs, with all the accessories of their European prototypes, such as golf-links, cricket-grounds, race-courses, etc. Farther inland it is crossed by beautiful roads bordered with bungalows embosomed in luxuriant gardens. The native part of the city, or *Pettah*, is dirty and crowded, with crooked and narrow streets, always thronged with motley crowds of different types and nationalities. The houses are without doors or windows, and the passer-by can freely observe the private life of the natives. Colombo owes its commercial importance chiefly to its artificial breakwater, one of the largest structures of its kind. It has a length of 4000 feet, and shelters a water area of 500 acres. Begun in 1875, it is still uncompleted, the northern arm and the graving dock still being in process of construction. The shipping of the port of Colombo is very extensive, amounting to about 3,500,000 tons annually. Colombo is one of the most important coaling-stations for British and foreign steamers on the Australian and East Asiatic routes. Almost all the staples of the island find their outlet through Colombo, which is also the centre of coconut, tea, and several other industries. It is connected with Kandy and Pointe-de-Galle by railway. It is the seat of a United States consulate.

The population of Colombo in 1901 was 158,093 (127,836 in 1891), including about 5000 Europeans, chiefly Englishmen and descendants of the Dutch. The natives are mostly artisans and laborers, while the Europeans are either owners of large plantations or merchants.

The early name of Colombo, Kalan-totta, the 'Kalany ferry,' derived from its proximity to the river, the Moors corrupted into Kalambu, and by this designation it was described about A.D. 1340 as the finest city of Serendib. At the arrival of the Portuguese, in 1517, Kalambu had merged into Kolamba, or Columbu, which they henceforth wrote Colombo, in honor of Christopher Columbus. It was taken by the Dutch in 1656, and by the British in 1796. Consult Cave, *Golden Tips* (London, 1900).

COLÓN, kô-lôn', or ASPINWALL. A town in the Department of Panama, Colombia, situated

on the Caribbean shore of the Isthmus of Panama, 49 miles northwest of the city of Panama (Map: Colombia, A 2). It is the northern terminus of the Isthmian Railway, and of the proposed Panama Canal, and has a deep harbor (Navy Bay), which is exposed, however, to violent wind-storms from the north. Its position, as the intermediary point for the Atlantic and Pacific trade, has increased its importance at the expense of its rival, Panama. Its growth has been retarded by its unhealthy site, though this has been remedied somewhat by drainage. The town received the name of Aspinwall from one of its founders, who also built the railway across the Isthmus; but it is now better known as Colón, in honor of Columbus, to whom a magnificent statue was erected in 1870. Population, estimated, 3000.

COLÓN (Sp., Columbus). A town in the Province of Matanzas, Cuba, about 52 miles southeast of Matanzas, connected by rail with Havana, Matanzas, Cardenas, and other important cities. It is the centre of extensive sugar-refineries. Population, in 1899, 7175.

CO'LO'N (Lat., from Gk. *κῶλον*, *kolon*). The portion of the large intestine that extends from the cæcum (q.v.) to the rectum, which is the terminal portion of the intestinal canal. It is divided into the ascending, the transverse, and descending colon, and the sigmoid flexure. See ALIMENTARY SYSTEM.

The whole length of the colon, from its commencement in the cæcum to its termination in the rectum, is rather more than four feet. It is retained in its position by the serous membrane, which envelops, more or less, all the intestinal viscera, and is termed the peritonæum (q.v.). Its structure is essentially the same as that of the rest of the intestinal canal, which is described in the article DIGESTION, ORGANS AND PROCESS OF; but in consequence of a peculiar arrangement of the longitudinal muscular fibres, the interior of the colon is divided into sacculi, which serve to retain its contents for a longer period than if it were a uniform tube, and thus, by extracting water from them, to reduce them to a more solid consistence, such as is possessed by normal excrement. It is also devoid of villi, and it is of much greater size than the small intestine. In some animals, as in the horse and sheep, the shape of the fæces is completely molded in these cells.

COLON BACIL/LUS, or **BACILLUS COLI COMMUNIS**. A micro-organism discovered by Escherich in 1885, and since demonstrated to be a normal inhabitant of the intestinal tract in man and some of the domestic animals. It is a short bacillus with rounded ends, is somewhat motile, has a few flagellæ, and does not form spores. The main interest which attaches to this organism at present is due to its close resemblance to the typhoid bacillus, with which it is morphologically identical, but from which it may be distinguished by its biological peculiarities. Some investigations made within the last few years tend to show that this bacillus, while of normal occurrence in the healthy intestine, may, under certain conditions, migrate to other organs of the body, and there be associated with pathological processes.

COLONEL, *kēr'nel* (originally *coronel*, *coronell*, from Sp. *coronel*, *colonel*, It. *colonello*,

Fr. *colonel*, *colonnel*, from Sp. *colonello*, column at the head of a regiment, dim. of *colonna*, column, from Lat. *columna*, column; the first *l* is changed to *r* either through dissimilation, or through popular confusion with Lat. *corona*, crown). A military title, ranking in the United States Army between lieutenant-colonel and brigadier-general. The command appropriate to the grade is a regiment. In Europe the title has more of an honorary than a practical value, it being in most instances an honorary distinction bestowed upon royal and other distinguished personages. In England, the custom prior to 1888 was to give the appointment of colonel to retired general officers as a reward for long service. Since that date no officer can obtain the rank except as a brevet, and then only for distinguished service, or on such appointments as the colonel commanding a territorial district depôt. See RANK AND COMMAND.

COLONEL CHABERT, *LE*, *lc kó'ló'ně' shá'bâr'*. A story by Balzac (1832), the tale of a soldier of the Grand Army, who comes back from a German hospital to find his wife married to another. She denies his identity, and he succumbs in the struggle to prove his legal rights.

COLONEL JACK, **HISTORY OF**. A novel by Defoe (1722). Beginning life as a thief, the hero goes to Virginia, and finally becomes a respectable planter and slave-owner.

COLONIA, *kó-ló'ně-á* (Sp., colony). The capital of the department of the same name, Uruguay, on the Rio de la Plata, nearly opposite Buenos Ayres. It has a good harbor, docks, and a dry dock, and is a place of some commerce, particularly with Buenos Ayres (Map: Uruguay, F 10). Population, about 1500. Colonia was founded by the Portuguese about 1680 under the name Colonia del Sacramento. Owing to its nearness to Buenos Ayres, it gave rise to many conflicts for its possession between the Spanish and the Portuguese. In the course of one of these struggles it was almost totally destroyed in 1777. In 1806 the English, in a desperate attempt to secure the La Plata region, captured Colonia and held it for some months.

COLO'NIA AG'RIPPI'NA. The Roman name of Cologne (q.v.).

COLONIAL CORPS. A term formerly applied specifically to colonial troops of the British Empire, but now in general use as referring to similar troops of other nations. They are usually raised for service in the colony to which they belong, and not for foreign operations. An exception to this rule is the use made of the West Indian regiments of Great Britain, in the frequent punitive expeditions on the west coast of Africa. Colonial corps are officered entirely by the regular army officers of the nation to which the colony is subject. English colonial corps are the British Central Africa Rifles, the West African regiments (negroes), the Hong Kong Regiment, and Chinese Regiment (at Wei-hai-wei). In the French colony of Madagascar one-half the total number of troops are colonial corps, natives of Madagascar. The Philippine Scouts served a similar purpose in the United States army.

COLONIAL DAMES OF AMERICA, **NATIONAL SOCIETY OF THE**. A women's patriotic society, organized in Wilmington, Del., in 1892.

It is composed of State societies, of which there is one in each of the thirteen original States and in the District of Columbia, together with associated societies in the non-colonial States of California, Illinois, Michigan, Minnesota, Iowa, Ohio, Colorado, Maine, Missouri, Wisconsin, Tennessee, Louisiana, Kansas, Indiana, Alabama, Texas, Arkansas, West Virginia, Mississippi, Oregon, and Vermont. The objects of the society are the collection and preservation of manuscripts and relics of Colonial days; the restoration of historic buildings; the more general diffusion of information concerning the Colonies, and the stimulation of a spirit of true patriotism. Membership in the society is limited to women who are especially invited, and who are descended from some ancestor of worthy life who came to reside in an American colony prior to 1750. Much valuable historical work has been accomplished by various State societies in locating and preserving sites by means of tablets and other memorials. The total membership of the society is about 5000.

COLONIAL DAMES OF AMERICA, SOCIETY OF. A women's patriotic society, organized in New York City in 1890, incorporated in 1891, and having for its purposes the collection of manuscripts, traditions, relics, and mementos of Colonial and Revolutionary times, and the commemoration of the success of the Revolutionary War. Membership in the society proceeds by invitation, and is restricted to women who are directly descended from some ancestor of distinction who came to reside in an American colony before 1776. This society was the first organization of women to be founded for patriotic purposes, and now has chapters in New York, Philadelphia, and Baltimore.

COLONIAL EDUCATION. See EDUCATION, COLONIAL.

COLONIAL WARS, SOCIETY OF. A patriotic society, organized in New York City in 1893. It consists of a general society made up of general officers and of delegates from the various State societies as follows, in the order of their institution: New York, Pennsylvania, Maryland, Massachusetts, Connecticut, District of Columbia, New Jersey, Virginia, New Hampshire, Vermont, Illinois, Missouri, Ohio, Nebraska, Minnesota, Kentucky, California, Colorado, Iowa, Georgia, Michigan, Wisconsin, Delaware, Rhode Island, Washington, and Maine. The various State societies have, for their general object, to perpetuate the memory of Colonial events, and of the men who, in military, naval, and civil positions of high trust and responsibility, by their acts of counsel assisted in the establishment, defense, and preservation of the American Colonies. With this end in view, they seek to collect and preserve records of every kind relating to the Colonial period of American history and to inspire in their members the fraternal and patriotic spirit of those who made American freedom and unity possible. They admit to membership male descendants of those who assisted in the establishment, defense, and preservation of the American Colonies. The publications of the general society include general registers and historical papers and registers by the various local societies. The general society has caused the erection of a monument at Louisburg, on Cape Breton Island, and memorial

tablets have been placed by the New York society on the sites of Fort Oswego and Fort Ticonderoga. The membership is about 4000.

COLONIES OF PLANTS OR ANIMALS. See COENOBIA and POLYP.

COLONIZATION SOCIETY, THE NATIONAL, OF AMERICA. An association organized in 1816, by Robert Finley (q.v.), "to promote a plan for colonizing (with their consent) the free people of color residing in our country, in Africa, or such other place as Congress may deem most expedient." Branches were established throughout the country and an active propaganda was conducted in almost every State, the official agents of the society speaking frequently in public and soliciting the coöperation of the various State legislatures. The first colonists were sent out to Sherbro Island, Africa, in 1820; and two years later Liberia was founded. Bushrod Washington, Charles Carroll, James Madison, Henry Clay, and J. H. B. Latrobe served successively as presidents of the society, while such men as Bishop Hopkins, Rufus King, Dr. Channing, Benjamin Lundy, Gerrit Smith, and James G. Birney were at one time zealous members. After about 1831, however, when the movement for abolition may be said to have first attracted general attention, the inadequacy and impracticability of the society's aims became increasingly apparent, and many of its more influential members withdrew their support. Its persistent refusal to interfere in any way with slavery, moreover, and its apparent encouragement of the racial prejudices of the whites against the blacks alienated many others who, though strongly opposing the radicalism of Garrison, believed in a policy of gradual abolition, and had faith in the negro's capacity for improvement. The general idea of colonization seems to have originated with the Rev. Samuel Hopkins, of Newport, in 1770. Consult: Wilson, *History of the Rise and Fall of the Slave Power in America*, vol. i. (Boston, 1875); and Alexander, *A History of Colonization on the Western Coast of Africa* (Philadelphia, 1846).

The shortcomings of the society's aims, judged from an abolitionist standpoint, are admirably set forth in Garrison, *Thoughts on Colonization* (Boston, 1832); Birney, *Letter on Colonization* (New York, 1834); and Jay, *An Inquiry into the Character and Tendency of the American Colonization and Anti-Slavery Societies* (New York, 1834).

COLONNA. A celebrated Italian family, prominent in the history of Rome from the twelfth century to the sixteenth. They were hereditary enemies of the Orsini (q.v.), and their numerous strongholds around Rome made them at all times formidable enemies to the Papacy, and on occasion its masters. To Rome, the Colonnas gave a pope, thirty cardinals, and a great number of senators and military commanders. The name of the family was probably derived from Colonna, a small settlement near the fortress of Palestrina; and Pietro of the Column, lord of Palestrina in 1100, is commonly regarded as the ancestor of all the princely branches of Colonna, comprising at present the houses of Colonna-Paliano, Colonna di Sciarra, and Colonna-Stigliano.—EGNO COLONNA was born at Rome about 1247. He entered the Augustine Order and pursued the study of theology at Paris, where he

was preceptor to Philip the Fair. He became general of the Order in 1292, and in 1296 was made Archbishop of Bourges. He was the author of a political treatise entitled *De Regimine Principum*, dedicated to Philip the Fair, and noteworthy for its systematic treatment of the art of war. He died in Avignon in 1316 and was buried at Paris. Of his works, which are marked by a good deal of dull erudition, part have remained unpublished.—LANDOLFO COLONNA was a canon of Chartres in the first half of the fourteenth century. There are attributed to him a manual of history from the creation to the pontificate of John XXII., a history of the Popes, and a Latin work, *De Statu et Mutatione Romani Imperii*.—SCIARRA COLONNA was a bitter enemy of Pope Boniface VIII. War broke out between the two in 1297 over the possession of Palestrina. Sciarra was excommunicated and deprived of all his honors, and after the destruction of Palestrina by the Papal forces in 1298 was compelled to flee to France. He gained the favor of Philip the Fair, and, returning in the company of the French Chancellor Nogaret in 1303, resumed hostilities with the Pope, and on September 7th took the aged pontiff prisoner at Anagni. (See BONIFACE VIII.). He became Senator of Rome in 1313. He embraced the cause of Louis the Bavarian, whom he crowned Emperor in Saint Peter's in 1328, but on the latter's departure was forced to flee from Rome. He died in exile in 1329.—STEFANO COLONNA, brother of Sciarra, was made Governor of Bologna in 1289. Involved in the struggle against Boniface VIII., he fled to France at about the same time as his brother. He returned after the death of Boniface and assumed a leading part in Roman politics, acting in opposition to Rienzi (q.v.), who drove him from the city in 1347. Stefano was a friend of Petrarch, who speaks of him in the *Trionfo della fama* and in his sonnets.—GIOVANNI COLONNA led an insurrection against Boniface IX. in 1404, and after the election of Innocence VII. joined forces with Ladislaus of Naples, driving the Pope from the city in 1413. He was killed in 1417.—OTTONE or ODDONE COLONNA was Pope from 1417 to 1431. See MARTIN V.—FABRIZIO COLONNA joined Charles VIII. of France in the invasion of Naples in 1494, but soon went over to the enemy and was made Grand Constable of Naples. He defended Capua against the forces of Louis XII. and took part in the battle of the Garigliano (1503). In the Holy League against France he was commander of the Papal forces, and, with his Spanish allies, was defeated by Gaston de Foix at Ravenna in 1512. He died in 1520. His military talents are lauded by Machiavelli in his *Arte della guerra* and by Ariosto in the *Orlando*. His daughter was Vittoria Colonna. (See COLONNA, VITTORIA).—POMPEO COLONNA, one of the ablest generals of his time, fought under Gonsalvo de Cordova against the French. In 1513 he defeated the Venetian General Alviano in the neighborhood of Vicenza. He took Milan from the French in 1521, and in the following year gained the victory of La Bicocca over Marshal Lautrec, and captured Genoa. In 1523 he held Milan against the French, but was struck down by disease, and died toward the end of the year of fast living.—Another POMPEO fought in the wars of the great Cordova, distinguishing himself at Cerignola (1502) and the Garigliano (1503). He entered the Church after the death of Alexander

VI., and in 1517 was made Cardinal. He took an especially active part in political affairs during the pontificate of Clement VII., whose enemy he was. He was made Viceroy of Naples in 1530, and died suddenly June 23, 1532.—ASCANIO COLONNA, the son of Fabrizio, shared the family hatred for Clement VII. With the support of the Spaniards he stormed Rome September 20, 1526, and sacked Saint Peter's and the Vatican. Entering the service of Charles V. he was made Grand Constable of Naples, but toward the end of his life fell into disgrace. He died in prison in 1557.—MARC ANTONIO COLONNA was exiled from Rome by Pius IV. and entered the military service of Spain, whose forces he successfully commanded against the Papal States in 1556. He was thereupon recalled and commanded the Papal galleys in the battle of Lepanto, October 7, 1571. He was made Viceroy of Sicily, and died in 1584.—FABIO COLONNA, born at Naples in 1567, was a botanist of some eminence. He was the author of *Storia naturale del Messico*, a work based on that of Hernandez. He died in 1651. Consult: Cirocco, *Vite de alcuni cardinali de casa Colonna* (Foligno, 1635); Agostino, *Storia de casa Colonna* (Foligno, 1608); Coppi, *Memorie Colonesi* (Rome, 1855); Gregorovius, *The History of the City of Rome in the Middle Ages* (London, 1895-1900).

COLONNA, GIOVANNI PAOLO (1640-95). An eminent Italian composer. He was a pupil, in Rome, of Carissimi, Benevoli, and Abbatini, became chapel-master of San Petronio in Bologna, and was repeatedly president of the Accademia Filarmonica there. One of the most distinguished Church composers of the seventeenth century, he is remembered as the head of the Bolognese School, which produced many famous musicians. His best works for the Church, including masses, psalms, litanies, motets, etc., for from three to eight voices, were published in twelve collections (1681-94). He also produced the oratorio *La profezia d'Eliseo* (1688), and an opera *Amilcare* (1693).

COLONNA, VITTORIA (1490-1547). An Italian poet. She was the daughter of Fabrizio Colonna, the Grand Constable of Naples, and was born in the Castle of Marino near Rome. Her youth was passed among the greatest literary spirits of Italy, and from them she gathered a love of learning, and in that atmosphere composed her first poems. At seventeen she married Francesco Ferrante d'Avalos, Marquis of Pescara, to whom she had been betrothed since childhood. He became a favorite general of Charles V., and her verses until his death, which occurred from wounds received at the battle of Pavia (1525), are concerned with his repeated absences, and finally with her grief at his loss. The beginning of her friendship with Michelangelo probably came about this time; certainly it was not until her widowhood that their relations became such as to have immortalized her in Angelo's unpolished, powerful sonnets. Just what the relationship was is a debated question. Only a few of her letters to him remain, and those are never lover-like. "Magnificent master," she calls him in one of them, and in another, thanking him for a picture of the Descent from the Cross, she says: "I rejoice greatly that the angel on the right is so beautiful, because it seems to me that it is

in some way a promise that Saint Michael will on the last day place you, Michelangelo, on the right hand of Our Lord." Such is the strain in which they are couched. She spent about ten years in Naples and Ischia, often visiting Rome, where she constantly saw the sculptor. In 1541 she went to Orvieto, and then to Viterbo. During her last visit to Rome she was taken ill, and died in the Colonna Palace. Reginald Pole, the cardinals Contarini and Bembo, and Castiglione and Bernardo Tasso, were among her friends, and Charles V. came to visit her. Her influence was felt throughout the first half of the sixteenth century, but she is better remembered for a kind of grace she gave that brilliant but brutal and coarse age than for the quality of her poetry. The second series of her poems, known as the *Rime Spirituali*, is better than the earlier one; all of them have been collected under the title *Rime della divina Vittoria Colonna*, and published a number of times. The best edition is that by Ercole Visconti (1840). Her letters have also been collected as *Lettere inedite ed altri documenti relativi ai Colonnese* (1875); *Alcune lettere inedite* (1884); and *Carteggio* (1888). Consult: Saltini, *Rime e lettere di Vittoria Colonna* (Florence, 1860); Reumont, *Vittoria Colonna: Leben, Dichten, Glauben im sechszehnten Jahrhundert* (Freiburg, 1881); Lawley, *Vittoria Colonna: A Study with Translations* (London, 1889); Roscoe, *Vittoria Colonna: Her Life and Poems* (London, 1868).

COLONNA, CAPE. See CAPE COLONNA.

COLONNADE' (Fr., from It. *colonnato*, row of columns, from *colonna*, Lat. *columna*, column). The name given to a series of columns placed at certain regular intervals in a row, according to the style and order of architecture employed. The term includes not merely the columns, but their superstructure, which must be a straight architrave. Where a row of columns similarly arranged supports a series of arches it is called an arcade (q.v.).

COLONNA PALACE. The palace of the Colonna family at Rome. It contains an important gallery of pictures, and has a beautiful garden containing remains of the Baths of Constantine, which occupied the site.

COLONNE, kô'lôn', JULES JUDE, called EDUARD (1838—). A French orchestra leader and violinist, born at Bordeaux. He was a pupil, while at the Conservatory in Paris, of Sauzai, Elwart, and Ambrose Thomas. After taking the prize in harmony, and the first *prix de violon* at the Conservatory, M. Colonne became first violin at the opera house, but gave that up in order to establish a series of Sunday concerts at the Odéon, known later as the Association Artistique. He gave Paris its first hearing of works by Tschaiikowsky, Greig, Wagner, and Raff, but his chief claim to distinction is that he forced the French public to do justice to the genius of Berlioz.

COLONNE DE LA GRANDE ARMÉE, de là grân dâr'má'. A Doric column near Boulogne, France, commemorating Napoleon's project of invading England and founding a republic there. It is 172 feet in height, and surmounted by a bronze statue of Napoleon. It was begun in 1804, but was not finished until 1841.

COL'ONNETTE' (Fr., dim. of *colonne*, column). In architecture, a small column used

more for decorative than constructive purposes. It is seldom found in ancient monuments, being a characteristic feature of the Middle Ages. The façades and apses of Tuscan churches (Pisa, Lucca), and the interior galleries of French Gothic cathedrals, show how rich an effect can be obtained by long lines of such colonettes, connected by arches and either free-standing or placed against a wall.

COL'ONSAY. One of the Inner Hebrides, or Western Isles of Scotland, off the southwest mainland of Argyllshire, in the Firth of Lorne, between the isles of Islay and Mull, with the small isle of Oronsay, of the southern end, separated by a narrow sound, dry at low water (Map: Scotland, B 3). Colonsay and Oronsay are together 12 miles long from northeast to southwest, and one to three miles broad. The surface is irregular, and composed of mica-slate. Half the surface is cultivated. Next to Iona, Colonsay contains the most extensive remains of religious edifices in the Western Isles. On Oronsay stands a large stone cross and the ruins of a monastery founded in the fourteenth century. Population, 500.

COLONY (Lat. *colonia*, from *colonus*, a husbandman, colonist, from *colere*, to till). In its proper sense, colony denotes a body of immigrants living in a foreign land under the laws and protection of the mother country; but the term has been used loosely to describe all classes of distant territories dependent in any form on a ruling power, from mere military posts like Gibraltar or Port Arthur to practically autonomous States like Canada or Australia. The Greeks were preëminently a colonizing people. They established communities in Asia Minor, in Thrace and the Crimea, on the coast of Africa, in Italy and Sicily, and in Gaul. Marseilles was a Greek town, founded by the inhabitants of Phœcia about six centuries before the Christian Era. The first great colonization movement of the Greeks followed as a consequence of the so-called Dorian migration, when the conquered peoples were driven from their lands and compelled to find new homes. The second movement, which took place in the period between the eighth and the sixth centuries B.C., was due to political disturbances at home, the necessity of drawing off the surplus of population, and military and commercial interests. When it had been determined to send out a colony, the oracle was consulted, and a leader, called *oikist*, *oikistês*, was duly appointed; fire was taken from the sacred fire that burned in the Prytaneum, and the new society, though politically independent, patterned itself after the mother city. The relation between the two communities was one of mutual affection only; but, if the new colony undertook itself to found a colony, it went, through custom, for its *oikist* to the mother city. Differing from the colony as thus described was the *cleruchy* (*κληρουκία*, allotment or apportionment, from *κλήρος*, lot, and *ἔχειν*, have), the members of which remained in close connection with the mother city and did not form an independent community. The Athenian cleruchies, the only ones of which we have any detailed knowledge, possessed a certain measure of autonomy, but only in internal affairs. The citizens were still citizens of Athens, with the rights and duties of

the position. In the case of a cleruchy, the conquered territory was divided into parcels and assigned to the poorer citizens by lot. The original inhabitants, though, according to circumstances, differently treated, were generally made dependents of the settlers. The first Athenian cleruchy was sent to the land of Chalcis in Eubœa, about B.C. 506.

It was one of the triumphs of the organizing genius of the Romans to develop the colony to its most perfect form. It was a principle of Roman policy that not only every conquered territory, but every district where Roman citizens settled, should be an integral part of the Empire. The *colonia* was one of the municipal institutions of the Empire, having its own governing corporation dependent on Rome. There were various grades of colonies—some where there was the high privilege of Roman citizenship, and others where the citizenship was of a humbler grade. Corresponding with the consuls in Rome, there were municipal officers in the colonies (*duumviri, quatuorviri*), in whom were preserved, after the Empire was formed, the old republican institutions. The Romans appointed men of very high rank to the government of their provinces or colonies—men who had held such offices as the consulship or pretorship at home. It was a feature of the Roman system to limit their period of government, lest they should become independent of the Empire and establish separate States.

After the fall of Rome, centuries passed before colonization recommenced; for the various tribes who broke into the Empire were not connected with any parent State, and the Normans who spread themselves over Europe at a later period were utterly unconnected, in the countries where they settled, with the government of the northern States whence they migrated. When Venice and Genoa were at the height of their power, they sought to advance their commercial interests by the establishment of colonies in the islands of the Mediterranean and on the shores of the Hellespont and the Black Sea. At the close of the Middle Ages the Portuguese and Spaniards became the great colonizing nations of Europe. Portugal was first in the field, establishing settlements along the western coast of Africa in the fifteenth century. After the rounding of the Cape of Good Hope by Bartholomew Dias in 1488, which was followed ten years later by the voyage of Vasco da Gama, she extended her settlements along the eastern coast and into India, finally penetrating to the islands of the Pacific. The Emperor Charles V., who ruled Spain when at the height of her power, aimed not only at the restoration of the Roman Empire in Europe, but at the creation of a new empire in America. Neither Spain nor Portugal followed the policy of developing the agricultural resources of the regions which they occupied, but merely used the colonies as a basis of profitable trade with the home country and as an asylum for high-salaried officials. Portugal established mere trading factories. The Spanish colonies were chiefly concerned with mining. They were governed by an official hierarchy, under the general direction of an executive department in Spain. The other governments of Europe—Great Britain, France, Holland, and the minor States—subsequently colonized in America, the East Indies, and Africa.

The earlier British colonies arose in the reverse order to those of Spain—the colonists went first, the dignitaries followed. This was especially true of the New England colonies. Before 1630 the British race had gained a firm foothold in America. The settlers were organized as privileged companies with royal letters patent, which in practice made them virtually independent of the Government at home; and as they were, for the most part, dissenters seeking a place of refuge from what they considered the grievances of the E-established Church and the Government, they took care not to convey the grievance with them. The northern colonists, indeed, acted as if they were a sort of private corporation. The policy of Great Britain toward her American colonies was the result of the accepted economic philosophy of the times (see POLITICAL ECONOMY), according to which it was thought that the trade with colonies must be strictly confined to the home country. The idea was that the colonies should supply raw materials to the mother country, and in return should purchase from the latter its manufactured products. Shipping was to be in the hands of the home country. This policy was no more characteristic of England than of other European States, and the reason why it encountered such vigorous opposition in the Anglo-American colonies was that the latter were settled by men who deliberately planned to establish homes in the New World, whereas those who made up the colonies of Spain, Portugal, or France were seeking wealth and prestige with which to re-establish their position in Europe.

During the eighteenth century Great Britain rose to a foremost position among colonial powers, and in the nineteenth century she firmly established her primacy. Rich compensation for the loss of the Thirteen Colonies—a loss which for a time seemed to threaten the dissolution of her empire—was found in the vast realm built up in India and in the flourishing colonies of Canada and Australia. In Africa, which became the principal scene of colonial activity for the European powers in the last quarter of the nineteenth century, Great Britain holds possession of Cape Colony and the former Boer republics, and of immense tracts of territory in Central and Eastern Africa. Coupled with her pre-eminence in Egypt, this would seem to assure to England a splendid colonial development in the Dark Continent. Spain's colonial empire attained its fullest development in the seventeenth century, declined in the eighteenth, and disappeared in the nineteenth. The Treaty of Paris, in 1763, deprived France of her possessions in America, and put a quietus on French colonization, Algeria excepted, for more than one hundred years, until the statesmen of the Third Republic initiated a new policy of expansion in Africa and the Far East. The Dutch establishments in the East were founded in great part upon the ruins of the colonial power of Portugal. At the time of the French Revolutionary wars, Holland was shorn of some of her possessions (Ceylon, Cape Colony), which went to increase the colonial domain of Britain. The annals of Dutch dominion in the East Indies have until recent times been the history of a nation seeking to enrich itself at the expense of downtrodden peoples. With the loss of Brazil in 1822, the importance of Portugal as a world-

THE WORLD SHOWING COUNTRIES AND THEIR COLONIES.





power departed. By its victory over Spain in 1898, the United States took its place among the colonial powers of the world; and through the solution of the problems presented by the necessity of reconciling the element of autocracy inherent in the administration of foreign possessions with the republican theory of American institutions, the term colony, already loose in meaning, has attained a still broader application. See the articles on the various countries for detailed accounts of their colonies.

BIBLIOGRAPHY. Brougham, *An Inquiry into the Colonial Policy of the European Powers* (Edinburgh, 1803); Heeren, *A Manual of the History of the Political System of Europe* (London, 1857); Money, *Java, or How to Manage a Colony* (London, 1861); Cairnes, *Colonization and Colonial Government* (London, 1873); Leroy-Beaulieu, *De la colonisation chez les peuples modernes* (Paris, 1874); Deckert, *Die Kolonialreiche und Kolonisationsobjekte der Gegenwart* (Leipzig, 1885); Roscher, *Kolonien, Kolonialpolitik und Auswanderung* (Leipzig, 1885); Payne, *History of European Colonies* (London, 1889); Norman, *The Peoples and Politics of the Far East* (London, 1895); Worsfold, *South Africa: A Study in Colonial Administration and Development* (London, 1895); Dubois, *Systèmes coloniaux et peuples colonisateurs* (Paris, 1895); Englehardt, *Les protectorats anciens et modernes* (Paris, 1896); Zimmermann, *Die europäischen Kolonien* (Berlin, 1896-1901); Lanesan, *Principes de colonisation* (Paris, 1897); Kidd, *The Control of the Tropics* (London, 1898); Reinsch, *World Politics* (New York, 1900), and *Colonial Government* (New York, 1902); Giddings, *Democracy and Empire* (New York, 1900); Dilke, *The British Empire* (London, 1899); Egerton, *A Short History of British Colonial Policy* (London, 1897); Gaffarel, *Les colonies françaises* (Paris, 1893); Lanesan, *L'expansion coloniale de la France* (Paris, 1886); Franzel, *Deutschlands Kolonien* (Hanover, 1889).

COL'OPHON (Lat., from Gk. Κολοφών, *Kolophōn*). An ancient Greek city of Ionia in Asia Minor. It was situated on the river Hales, about nine miles north of Ephesus, was the native city of Mimmermus, and claimed to be the birthplace of Homer. The expression, 'to put the Colophon,' meaning 'to give the finishing stroke,' is explained by Strabo as arising from the belief that the cavalry of Colophon was so excellent that it always decided the contest. Hence, *Colophon* of a device at the end of a book.

COL'QUIN'TIDA. See COLOCYNTH.

COLOR (Lat., connected with Lat. *celare*, Gk. κἀλλπτειν, *kalyptein*, Ger. *hehlen*, to hide, Ir. *celim*, I conceal, Skt. *śarana*, refuge). The color of an object in nature depends upon several conditions; the character of the light which illuminates it, the phenomena which take place in the body itself, the individual peculiarities of the eye which views the body. It has been shown by Sir Isaac Newton that ordinary white light may be regarded as a mixture of many colors; that is, it may be analyzed into parts, each part producing a different color-sensation. In scientific language, the sensation white, as perceived by looking at any ordinary 'white' object, is due to the incidence upon the eye of trains of ether-waves of different wave-numbers,

varying continuously between certain limits; while, if a train of waves of a definite wave-number enters the eye, the sensation of color (if any) will be of a definite hue. Thus we speak of yellow light, of red light, etc., meaning those ether-waves which produce these sensations of yellow or red in a normal eye. When the ether-waves fall upon an object, some of the energy goes into reflected waves *at the surface*, the rest goes into the entering waves; there will in general be absorption in the interior; but if the body is transparent there will be transmitted waves, and also, in general, waves reflected and scattered by little particles in the interior of the body. The color of a green leaf is due to the fact that when viewed in ordinary daylight, out of all the waves which enter the leaf, only those which combine to produce the sensation green are transmitted, the others being absorbed by the coloring matter of the leaf; thus, those waves which are scattered by the minute interior parts traverse a layer of this coloring matter, and only green light emerges from all sides. The light which in this case is reflected at the surface is simply diffuse white light. An object whose color is due, as here, to what is called 'body absorption,' appears of the same color when viewed by reflected light or by transmitted: that is, if we look *through* it at the source of light, or look at it from the same side as is the source. The colors of almost all natural objects are due to this body absorption.

The colors of metals, however, and some aniline dyes, are due to what is called 'surface absorption.' When white light is incident upon a piece of gold, yellow light is reflected *by the surface*, thus giving the yellow color. If, however, the gold is hammered out exceedingly thin, it will be found to transmit greenish-blue light; so that in the case of surface color, the colors by reflection and transmission are different.

The energy of the waves which are absorbed in bodies generally goes to producing heat effects; but in some cases it is spent in producing other ether-waves, thus giving rise to other colors. These bodies are called 'fluorescent.' (See FLUORESCENCE.) In these cases, then, the color as seen by transmission and by looking at the bodies sidewise will be different.

The color of the blue sky, of fine smoke, and of water in many lakes is due to the scattering of light by extremely small particles—generally minute solid particles: for the short waves—that is, blue light—are reflected by minute particles, while the other waves simply pass around them. In all these cases it is evident that if the incident light is altered, so will be the color perceived. A green leaf in a yellow light would appear black. For an excellent treatise on color, consult Rood, *Modern Chromatics* (New York, 1879). See LIGHT.

COLOR. In art, either the pigment employed to produce a certain effect to the eye, or the effect thus produced—i.e. the tint of a picture. In the former sense it is treated of in this work under the names of the colors themselves. In the latter sense it may be defined as the general effect of all hues entering into the composition of the picture.

The sensation of color is produced by waves of light setting into vibration fibres of the optic nerve, and the length of these light-waves is

the cause of the different hues. For example, when the light-wave is $\frac{1}{380000}$ of an inch long, red is the color produced, and as the waves decrease in force, we see yellow, green, blue, and so on through the spectrum. According to the theory of Chevreul, now generally accepted, white light is the union of all colors, and its decomposition by an object reveals the color separated from the rest. Thus, a rose absorbs all colors but red, which it reflects; while a white substance, rejecting all colors, is therefore colorless. Correctly speaking, there are but six colors—three primary (red, blue, and yellow), and three secondary (orange, violet, and green). Orange is composed of purple and yellow, violet of red and blue, green of yellow and blue. All other colors are compounds of these.

Complementary Colors are those which, combined with another color or colors, make up the three primary colors constituting white light. If the given color be primitive, its complement is composed of the other two primitive colors. For example, the complementary color of blue is orange—that is to say, red and yellow. If the given color be a secondary, its complementary is the remaining primitive color—as, for instance, the complementary color of green (blue and yellow) is red. In painting, brilliancy of coloring may be obtained by placing complementary colors side by side, because each lends to the other a favorable halo, while the juxtaposition of non-complementary colors has the opposite effect of dullness. This method of heightening and softening colors was used with great effect by Delacroix, and is to-day much practiced by French and Spanish painters.

It is also usual in the studios to divide colors into warm tones and cool, according as they approach or depart from the colors of sunlight. Reds, oranges, and yellows are regarded as warm; blues, greens, and violets as cool. In painting it has long been customary to relieve warm colors by placing them near cool. This is especially marked in Correggio's pictures, which have a central point of warm color with the surroundings cool. The Florentines reversed this process, while the Venetians intermixed warm and cool tones, and Rubens placed them side by side.

Contrast of Color is either simple or compound. Each of the primitive colors forms a contrast to the other two. Thus, blue forms a simple contrast to red and yellow. But if red and yellow were mixed together, the complementary colors to blue would be produced—viz. orange, which is the most powerful contrast to blue. This was the earliest and simplest way of obtaining color effects. It was almost universal among the Italians of the Renaissance, as witness the reds and blues in the garments of the Madonna and the saints. In modern times it has been much used, but not with the same success, by the pre-Raphaelites in England and the followers of Ingrès in France.

Harmony of Color is more difficult to attain, and is based rather upon the accord than upon contrast or the use of complementary colors. In nature there are few sudden contrasts of color, but rather gradual transitions and delicate gradations. Harmony endeavors to preserve the same tones in a painting as exist in nature. It discriminates between the same color seen in sun-

light and in shadow, near or at a distance; or, in other words, between the values of colors. No matter how different the colors of the pictures, they must all accord with the dominant color-tone.

The mastery of color is the most difficult achievement of painting, and it has been truly said that the colorist, like the poet, is born and not made. Few even among the great painters have attained it. Concerning the Greeks, it is impossible to make statements with surety, since all their best work has perished. The East Indians attained it in the harmonious colors in their beautiful fabrics. Among the Italians of the Renaissance, the artists of Parma and Venice were distinguished as colorists, chief among whom were Correggio, Titian, and Veronese. Many of the old Dutch and Flemish painters were fine colorists, Rembrandt and Rubens being foremost among them. In the English school Turner was the only really great colorist; while the French school shows a stately array, including such names as Watteau, Chardin, Delacroix, Fromentin, Rousseau, Diaz, Millet, etc. In Spain the greatest colorists were Velasquez, Goya, and Fortuny. The American school of the past few years has produced a number of good colorists, among them La Farge, Sargent, and Whistler.

Consult: Van Dyke, J. C., *Art for Art's Sake* (New York, 1901); Blanc, *Grammaire des arts du dessin* (Paris, 1870); Reynolds, *Discourses Before the Royal Academy* (London, 1831).

COLOR. Specifically, in anthropology, the quality and degree of pigmentation of skin and other integuments. See ETHNOLOGY; ANTHROPOMETRY.

COLOR. In law, in a figurative sense, a semblance or appearance of something, implying that the thing to which the term is applied has not the quality or character claimed; as, *color of title* means an apparent but not valid title.

Formerly in common-law pleading in England, when the defendant, pleading by way of confession and avoidance, confessed that the plaintiff had, or gave him credit for having, a *prima facie* or apparent right, the 'confession' was said to give 'color,' and the defendant then pleaded matter by way of avoidance—i.e. to show that the facts pleaded by the plaintiff did not in law give ground for recovery against the defendant. See CONFESSION AND AVOIDANCE.

Color of Office is the semblance or pretense of authority, by virtue of an official position, assumed or claimed by an officer when he does some act outside of his actual jurisdiction. The term includes acts done under an honest but mistaken belief of power, as well as where one knowingly exceeds his authority from a corrupt motive. All such acts are void, and an officer who is thus guilty of an abuse of power is liable for any damages which may result from it. See CONVERSION; DE FACTO; FALSE IMPRISONMENT.

Color of Title is that which on its face appears to be proof of ownership, but which, by reason of some defect not easily discoverable, does not in law constitute a valid title. The term is generally used to describe documents purporting to give title to some one, but has sometimes been applied to a claim of ownership by adverse possession. A conveyance by one so claiming title gives the vendee only such rights as the vendor

has—i.e. the possession of the property under whatever muniments of title the vendor had, and a right to 'tack,' or add, the period of possession to make up the time necessary to gain absolute title by adverse possession. See ADVERSE POSSESSION; TITLE (to property).

COLOR, IN PLANTS. The great majority of plants show distinct coloration, especially in aerial or aquatic organs. The absence of color is an index of parasitic or saprophytic life, but it must be borne in mind that many parasites and saprophytes are highly colored. The most common coloring matter in plants is chlorophyll, which manifests itself in various shades of green. Light of some strength has been shown to be necessary for the development of chlorophyll, though recent experiments show that it may develop in various seedlings germinated in perfect darkness, and that the synthesis of carbohydrates may take place vigorously under a dense layer of cork. The presence of plastids and favorable conditions of nutrition are necessary for the proper development of chlorophyll. Yellow coloration in plants is also commonly associated with plastids, and is due to the relative abundance of xanthophyll or carotin present as compared with the true chlorophyll. The phenomenon of yellowness is most common in dying leaves, and is especially well shown in autumn. However, in many young leaves, especially where the nutrition conditions are unfavorable, yellow leaves also appear. Unfavorable nutrition is probably the cause of yellowness in most cases. In dying leaves the part near the veins usually remains green longest. In young leaves the green parts are longer and much better developed internally than are the yellow or white parts.

Red or blue coloration in plants is not directly associated with plastids, but is due to pigments that are scattered through the cell-sap. The coloring substances are called anthocyanins, erythrophyll if red, cyanophyll if blue. Blue colors occur most commonly in flowers, while the reds occur abundantly in leaves, as well as in flowers. The red coloration of leaves has been much discussed in literature, and deserves further mention. While in some plants, as coleus, red colors are more or less permanent, in most cases redness is periodic. Perhaps the three most common examples of color display are: (1) in the young actively growing leaves of seedlings or perennial shoots; (2) in wintering leaves, especially of rosette plants; and (3) in dying leaves, especially in autumn leaves. All kinds of causes have been assigned to account for periodic coloration, but by far the most satisfactory is one proposed by Overton in 1899. He has shown experimentally that an excess of sugar in nutrient solutions causes an early and rich development of color, while an absence of sugar retards this development. In the summer the products of a day's photosynthesis are commonly carried off before another day begins; but in the cool autumn nights this transfer is checked, and sugars accumulated in the leaf unite with tannin substances and cause the production of the pigments. A similar explanation, plus the great flow of sap, would account for red leaves in spring. Mechanical injury, which prevents the carbohydrate transfer, also causes an excess of sugar and gives rise to red colors. Light seems to favor color development, perhaps

because it favors the increased production of carbohydrates.

Much has been said as to the ecological significance of red colors. Stahl and Kny, as a result of experiments, hold that red colors increase the available supply of heat, and thus prolong the leaf activities in fall and enlarge them in spring. Kerner has also held the 'protective' theory of color. If red colors do have any such function—and this is by no means proved—it must probably be regarded as quite incidental. In no case can the need for protection be regarded as a cause of the development of pigment, as one might suppose from reading various treatises on the subject of color. See CHLOROPHYLL; PHOTOSYNTHESIS; LEAF. Consult Overton, "Beobachtungen und Versuche über das Auftreten von rothem Zellsaft bei Pflanzen," in *Jahrbuch für wissenschaftliche Botanik*, vol. xxviii. (Berlin, 1899).

COLORADO, kōl'ō-rā'dō (Sp., colored red) ('the Centennial State'). A State of the American Union, the twenty-fifth in order of admission. It lies between latitudes 37° and 41° N., and longitudes 102° and 109° W., and is bounded on the north by Wyoming and Nebraska, on the east by Nebraska and Kansas, on the south by Oklahoma Territory and New Mexico, on the west by Utah. Length from east to west, 380 miles; breadth, 275 miles; land area, 103,645 square miles; water area, 280 square miles.

TOPOGRAPHY. Colorado lies upon the great watershed of the continent, and is, after Wyoming, the most elevated State in the Union. A number of the most prominent ranges of the Rocky Mountain system traverse the State in a northerly and southerly direction, spreading magnificently over more than half the surface. The eastern section lies in the plain of the great Mississippi Basin, rising gradually from an elevation of about 3000 feet at the eastern boundary to a considerably higher altitude in the west. In the longitude of Denver and Colorado Springs the surface becomes broken by irregular chains of foot-hills. Back of these rise abruptly the lofty ranges of the Rockies. Entering the State from the north, they are called the Medicine Bow Range, and continue south as the Front Range to Pike's Peak, west of Colorado Springs. This is the most famous mountain in the State, but not the highest, being one of a score that range between 14,000 and 14,500 feet in elevation. West of these ranges are three valleys called North, Middle, and South Parks. North Park is inclosed on the west by the Park Range, and is separated from Middle Park by a ridge, extending from the east to the west, called the Divide. The North Platte River rises on its northern slope; on its southern, the Rio Grande. Between the Middle and South parks the Front Range meets the Saguache, the loftiest of them all. For miles its crest towers above the 13,000-foot level, surmounted by the impressive Holy Cross Peak, the Princeton, Harvard, Yale, and other mountains whose heights exceed 14,000 feet. To the southeast the range is continued in the Sangre de Cristo and Culebra, which extend into New Mexico. West of these latter ranges lies another valley called the San Luis Park, while west of this rise the San Juan Mountains. In the remainder of the western portion of the State there is a confusion of broken mountains, pla-

teaus, and valleys, with a general slope to the westward.

Of the many mountain passes, 13 are over 10,000 feet in altitude, the Argentine reaching 13,100 feet. The great valleys or parks above mentioned inclosed by mountains are a distinguishing feature of the scenery. San Luis Park contains 8000 square miles (the most level land in the State, though elevated 7500 feet). Other important valleys are the Arkansas (q.v.), Rio Grande (q.v.), White Grande, and Gunnison. There are over 39,964 square miles of park and valley lands. The North Platte and South Platte unite to form the Platte of Nebraska. The source of the South Platte is 11,176 feet above tide, and its fall in the short distance to Denver is 6000 feet. The Arkansas rises 10,176 feet above the sea in the west central part of the State, rapidly falling to 7877 feet, and flows southeast and east into Kansas, passing through the 'Royal Gorge' cañon, 3000 feet deep. The Rio Grande rises in the Saguache Range and flows through San Luis Park into New Mexico. The largest streams on the west are the Yampah and White, tributaries of the Green River, Utah; the Grand, one of the main affluents of the Colorado; and its tributaries, the Gunnison, Dolores, and San Miguel. None of these streams is navigable. No other State contains the headwaters of so large a number of rivers. From near the centre of the Commonwealth rivers flow outward in many directions, and the waters are distributed in almost equal proportions to the Atlantic and to the Pacific Ocean. The only lake of consequence, San Luis, about 60 miles long and a quarter of a mile wide, lies in San Luis Park, and receives several small streams, but has no visible outlet. The lofty peaks and deep-lying parks are equaled in grandeur by the river cañons; those of the Arkansas, Grand, Black Cañon of the Gunnison, Little Colorado, and Uncompahgre, varying in depth from 1000 to 3000 feet. 'The Garden of the Gods' and 'Monument Park' are filled with castellated buttes that rise out of green meadows, or with grotesquely shaped pillars and towers of red sandstone, carved by erosion. A large area in Saguache County has been reserved as a State park.

CLIMATE AND SOIL. The high altitude of the State premises a cool temperature; but, save on the higher elevations, extremes are rare, the climate being generally mild and remarkably salubrious. The days are sometimes hot, but the nights are cool and free of humidity. The yearly mean temperature at Denver (5182 feet) in January is 28.2° F.; July, 71.7° F.; Pueblo (4675 feet), January, 28.7° F.; July, 74° F. Frosts do not occur until late in the autumn and disappear early in the spring; but snows are heavy and lasting on the mountains, yet in the low levels are seldom deep, and very soon melt away.

The mean annual rainfall for the State is 14.8 inches. This fall, although light, is well distributed, and in many sections of the 'Great Divide' cereals are grown without irrigation. The heaviest rainfall is in the mountains. At Pike's Peak the mean precipitation is 29.7 inches; at Climax (10,304 feet), 34.8 inches. On the plains it is much less. At Denver the mean fall is 14.3 inches; at Colorado Springs (6032

feet), 14.5 inches; at Las Animas (3899 feet), 11.9 inches.

The atmosphere is so dry and pure that fresh meats are preserved by the simple process of drying. The late summer is almost rainless. The climate and air of Colorado are considered of great benefit to asthmatic and pulmonary sufferers, and the charming parks are likely to become the great natural sanatoriums of North America. Thousands of people flock to Denver, Colorado Springs, and other sections of the State to regain their health. The various mineral springs are also adjuncts to the remedial nature of the climate. The hot sulphur springs of Middle Park and Wagon-Wheel Gap, and the hot iron and soda springs of Manitou, Cañon City, Glenwood Springs, and Idaho Springs are famous.

The soil along the river-bottoms is largely alluvial. In the eastern part of the State it is a light loam. In some places siliceous and micaceous substances abound, while here and there clay formations crop out. The forests of the State cover about 10,500,000 acres of land, and are restricted mainly to the mountains.

For flora and fauna, see the paragraphs under **ROCKY MOUNTAINS** and **UNITED STATES**.

GEOLOGY. The geological structure of Colorado is extremely varied. In the less elevated region east of the Rocky Mountains, Cretaceous and Tertiary strata are exposed in nearly horizontal position and in great thickness. On the eastern flank of the Rocky Mountains these strata are succeeded by older sediments, including Silurian, Carboniferous, and Jura-Trias, which are upturned and in places intensely folded. The axis of the mountain system is formed by granites and other igneous rocks, more or less metamorphosed, of Archean age, with a great variety of later volcanic rocks. On the western edge of the system Paleozoic strata again appear, and are overlaid in the extreme western part of the State by Cretaceous, Jura-Trias, and Tertiary beds. The Carboniferous rocks, unlike those along the Appalachian Mountains, inclose no coal-seams. Coal occurs, however, in great abundance in the Laramie group of the Cretaceous. The great upheavals accompanied by volcanic activity along the Rocky Mountains have favored the formation of ore deposits, some of which are of great economic importance. Cripple Creek on the slopes of Pike's Peak, Leadville, Boulder, Ouray, Rosita, Silverton, Gilpin, Lake City, and Gunnison are important centres of gold, silver, and lead mining. Copper, zinc, manganese, and iron ores also occur in extensive deposits.

MIXING. Colorado is best known as a mining State, ranking first in the mining of precious metals, and surpassed only by Pennsylvania in the total mineral output. This is due largely to the State's great productivity of gold and silver ores. Colorado produces twice as much of these two metals as any other State, and more than one-third of the total output of the United States. The production of gold increased in value from \$4,150,000 in 1889 to \$28,760,000 in 1900. In 1897, for the first time, the gold product exceeded that of California, while the output for 1900 was twice that of the rival State. Silver-mining reached its maximum output in 1892, and then decreased until 1895; since which time it has slightly increased. The com-

AREA AND POPULATION OF COLORADO BY COUNTIES.

County.	Map Index.	County Seat.	Area in square miles.	Population.	
				1890.	1900.
Arapahoe	E 2	Denver.....	4,723	132,135	153,017
Archuleta.....	D 3	Pagosa Springs.....	1,209	826	2,117
Baca.....	F 3	Springfield.....	2,531	1,479	759
Bent.....	F 3	Las Animas.....	1,497	1,313	3,049
Boulder.....	E 1	Boulder.....	751	14,082	21,541
Chaffee.....	D 2	Bueavista.....	1,224	6,612	7,085
Cheyenne.....	F 2	Cheyenne Wells.....	1,787	534	501
Clear Creek.....	E 2	Georgetown.....	425	7,181	7,082
Conejos.....	D 3	Conejos.....	1,407	7,193	8,794
Costilla.....	E 3	San Luis.....	1,746	3,491	6,632
Custer.....	E 2	Silvercliff.....	696	2,970	2,937
Delta.....	C 2	Delta.....	1,201	2,534	5,487
Dolores.....	C 3	Rico.....	1,000	1,498	1,134
Douglas.....	E 2	Castlerock.....	880	3,006	3,120
Eagle.....	D 2	Redcliff.....	1,586	3,725	3,008
Elbert.....	E 2	Kiowa.....	1,852	1,856	3,101
El Paso.....	E 2	Colorado Springs.....	2,134	21,239	31,602
Fremont.....	E 2	Canon City.....	1,478	9,156	15,636
Garfield.....	C 2	Glenwood Springs.....	3,049	4,478	5,835
Gilpin.....	E 2	Central City.....	130	5,807	6,630
Grand.....	D 1	Sulphur Springs.....	1,873	604	741
Gunnison.....	D 2	Gunnison.....	3,277	4,359	5,331
Hinsdale.....	D 3	Lake City.....	1,003	862	1,609
Huerfano.....	E 3	Walsenburg.....	1,537	6,882	8,395
Jefferson.....	E 2	Golden.....	858	8,450	9,306
Kiowa.....	F 2	Sheridan Lake.....	1,780	1,243	701
Kit Carson.....	F 2	Burlington.....	2,168	2,472	1,580
Lake.....	D 2	Leadville.....	393	14,663	18,054
La Plata.....	D 3	Durango.....	1,848	5,509	7,016
Larimer.....	D 1	Fort Collins.....	4,337	9,712	12,168
Las Animas.....	E 3	Trinidad.....	4,802	17,208	21,842
Lincoln.....	F 2	Hugo.....	2,553	689	926
Logan.....	F 1	Sterling.....	1,733	3,070	3,292
Mesa.....	C 2	Grand Junction.....	3,309	4,260	9,267
Mineral.....	D 3	Creede.....	880	.....	1,913
Montezuma.....	C 3	Cortez.....	2,113	1,529	3,058
Montrose.....	C 2	Montrose.....	2,290	3,980	4,535
Morgan.....	F 1	Fort Morgan.....	1,264	1,601	3,268
Otero.....	F 2	Lajunta.....	2,042	4,192	11,522
Ouray.....	D 2	Ouray.....	557	6,510	4,731
Park.....	E 2	Fairplay.....	2,084	3,548	2,998
Phillips.....	F 1	Holyoke.....	677	2,642	1,583
Pitkin.....	D 2	Aspen.....	983	8,929	7,020
Prowers.....	F 3	Lamar.....	1,602	1,969	3,766
Pueblo.....	E 2	Pueblo.....	2,447	31,491	34,148
Rio Blanco.....	C 2	Meeker.....	3,249	1,200	1,690
Rio Grande.....	D 3	Del Norte.....	1,331	3,451	4,080
Routt.....	C 1	Hahns Peak.....	6,980	2,369	3,661
Saguache.....	D 2	Saguache.....	2,769	3,313	3,853
San Juan.....	D 3	Silverton.....	438	1,572	2,342
San Miguel.....	C 2	Telluride.....	1,310	2,909	5,379
Sedgwick.....	F 1	Julesburg.....	535	1,293	971
Summit.....	D 2	Breckenridge.....	603	1,906	2,744
Teller.....	E 2	Cripple Creek.....	551	.....	29,002
Washington.....	F 1	Akron.....	1,074	2,301	1,241
Weld.....	E 1	Greeley.....	3,918	11,736	16,808
Yuma.....	F 1	Yuma.....	1,162	2,596	1,729



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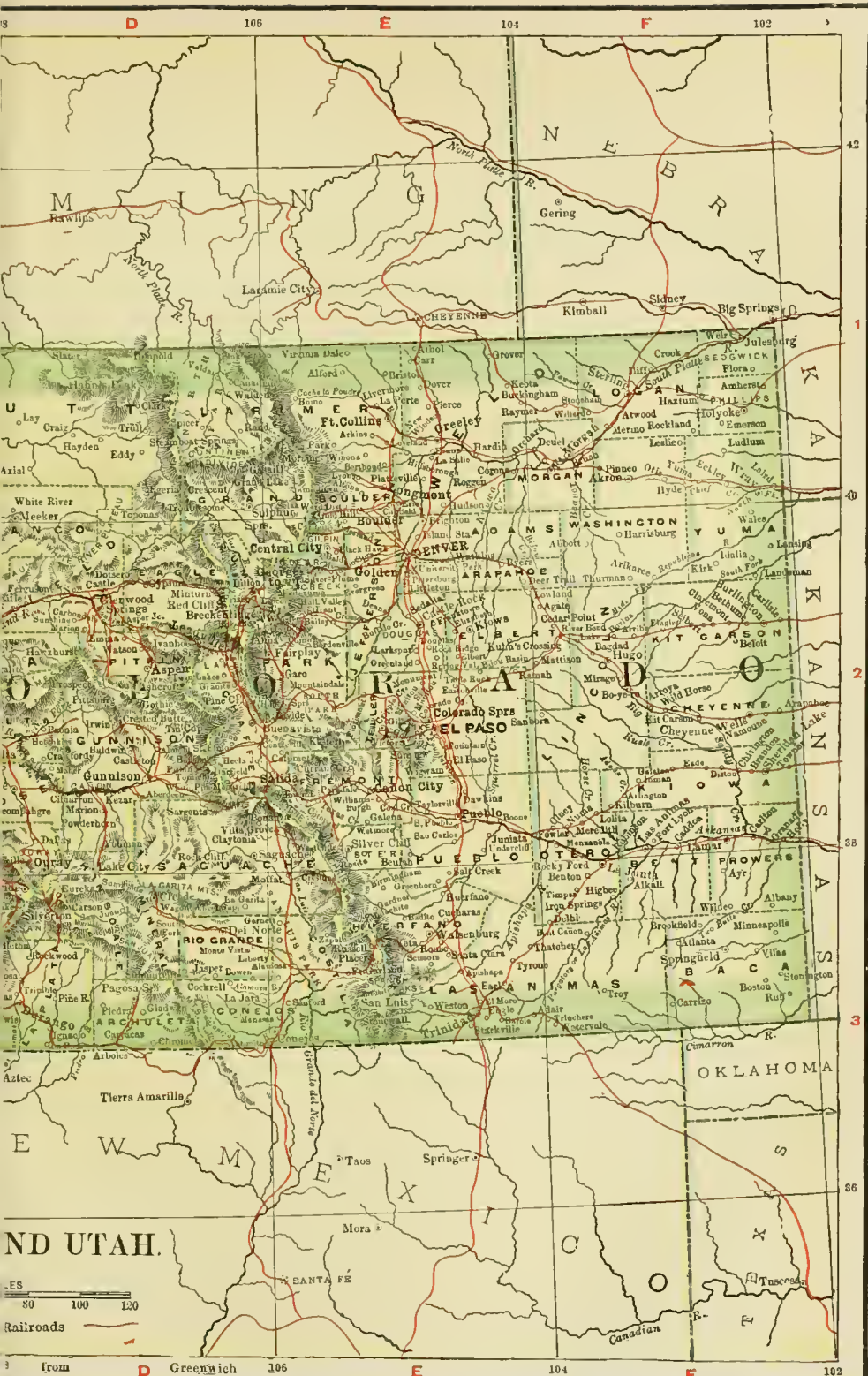
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AREA AND POPULATION OF UTAH BY COUNTIES.

County.	Map Index.	County Seat.	Area in square miles.	Population.	
				1890.	1900.
Beaver.....	A 2	Beaver.....	2,580	3,340	3,613
Boxelder.....	A 1	Brigham.....	5,436	7,642	10,009
Cache.....	A 1	Logan.....	1,181	15,509	18,139
Carbon.....	B 2	Price.....	1,596	.....	5,004
Davis.....	A 1	Farmington.....	285	6,751	7,996
Emery.....	B 2	Castledale.....	4,336	5,076	4,657
Garfield.....	A 3	Panguitch.....	5,103	2,457	3,400
Grand.....	C 2	Moab.....	3,759	541	1,149
Iron.....	A 3	Parowan.....	3,284	2,683	3,546
Juab.....	A 2	Nephi.....	3,300	5,582	10,082
Kane.....	A 3	Kanab.....	4,368	1,685	1,811
Millard.....	A 2	Fillmore.....	6,664	4,033	5,678
Morgan.....	A 1	Morgan.....	590	1,780	2,045
Piute.....	A 2	Junction.....	744	2,842	1,954
Rich.....	A 1	Randolph.....	1,050	1,527	1,946
Salt Lake	A 1	Salt Lake City...	768	58,457	77,725
San Juan.....	B 3	Monticello.....	8,025	365	1,023
Sanpete.....	B 2	Manti.....	1,561	13,146	16,313
Sevier.....	B 2	Richfield.....	1,880	6,199	8,451
Summit.....	B 1	Coalville.....	1,937	7,733	9,439
Tooele.....	A 1	Tooele.....	6,901	3,700	7,361
Uinta.....	C 2	Vernal.....	5,190	2,762	6,458
Utah.....	B 1	Provo City.....	2,123	23,768	32,456
Wasatch.....	B 1	Heber.....	4,147	3,595	4,736
Washington.....	A 3	Saint George.....	2,457	4,009	4,612
Wayne.....	B 2	Loa.....	2,372	.....	1,907
Weber.....	A 1	Ogden.....	544	23,723	25,239

mercial value of silver mined in 1900 was \$12,500,000. Colorado has for a number of years produced about one-fourth of the total lead output of the United States. The product steadily increased until 1883, when it was valued at \$6,000,000; in the succeeding years the annual output approximated \$5,000,000 until 1893, when it began to decrease. In 1898 it gave signs of revival, and in 1900 amounted to \$7,700,000. Increasing quantities of copper and iron are mined, and the advantage of a proximity to fuel and flux is giving Colorado steel and iron the control of the entire trans-Missouri market. Coal-mines are also rapidly developing, the State ranking eighth in the value of her output of coal, and fourth in the amount of coke produced. Nearly one-half of the coal is mined in Las Animas County, in the south, while an equal proportion of the mineral production is credited to Teller and Lake counties in the central part of the State, including the famous Cripple Creek district (q.v.).

AGRICULTURE. Colorado, with its extreme elevation and aridity, was long thought to be fit only for mining and grazing. But it has been found possible to utilize many of the water-courses, which are distributed so liberally over the State, for purposes of irrigation, and by this means large portions of the State have been brought into profitable cultivation, the total area irrigated in 1900 being greater than in any other State. Fourteen and three-tenths per cent. of the land surface was included in farms in that year, and 3.4 per cent. or 2,273,968 acres were improved, of which 1,611,271 acres, or 70.9 per cent., were irrigated. During the decade ending in 1900 the actual irrigated area increased 80.9 per cent. The main canals and ditches had a total length of 737.4 miles. The largest irrigated area lies to the east of the Rocky Mountains in the north central part of the State. The supply of water is here obtained from the tributaries of the South Platte River. The storage system is being adopted whereby the flood waters of this section are conserved. The Arkansas, Rio Grande, and the other streams are also drawn upon for purposes of irrigation, and every county contains some irrigated land. The eastern plain between the South Platte and Arkansas valleys is one of the least irrigated regions of equal extent in the State. By the application of improved methods, irrigation can be extended to a much greater area than has yet shared its advantages. Colorado is unlike California in that its irrigated area is devoted almost wholly to the less intensively cultivated crops. The value per acre of the product is therefore not so great as in the latter State, while the average size of the irrigated farm is much greater, being 35.4 acres, of which 9.1 acres are actually irrigated. Considerably over one-half of the crop acreage is devoted to hay and forage, the acreage of this kind of crop having nearly doubled in the last decade of the nineteenth century. Alfalfa constitutes nearly half of this amount, almost the entire acreage of alfalfa being irrigated. Its yield is very great, and in a large measure it is made to take the place of grain as feed for stock. The acreage in wheat exceeds that of all other cereals combined, and more than doubled in the decade ending in 1900. The flour manufactured from Colorado wheat ranks first in the market.

Oats and corn, respectively, rank next in importance, the acreage of the former having decreased and the latter having increased during the last census period. Increasing quantities of barley are raised. Irish potatoes are a very prominent crop in the northern part of the State. Hundreds of car-loads of muskmelons are annually shipped from the Arkansas River region. They include the famous Rocky Ford cantaloups, named after the town of Rocky Ford. The production of sugar-beets bids fair to become an important industry. In the last decade of the century remarkable progress was made in fruit-culture. The apple-trees, which constitute 69.3 per cent. of the total number of fruit-trees, increased during that period from 77,790 to 2,004,830, and the per cent. of increase of other varieties was equally great. The western slope of the State seems to be especially well adapted to the production of superior grades of fruit.

STOCK-RAISING developed before tillage was attempted, and for some time had almost the whole field to itself. The introduction of mixed farming has not been detrimental to this industry, but, on the contrary, has resulted in an increase in the number of animals raised. What is more, the long-horned Texas steer has given place to one with a pedigree. Large herds receiving little attention are being supplanted by many small herds carefully looked after. For every decade since 1870 the number of cattle has more than doubled. Sheep-raising, which is largely confined to the southern counties, made large gains in the last decade of the century. Horses and mules are raised in sufficient numbers to supply the local needs. The number of dairy cattle is rapidly increasing, and dairying is becoming a prominent industry. The tables appended show the relative importance of the different varieties of live stock and crops and the tendencies in their development:

Year	Wheat (acres)	Oats (acres)	Corn (acres)	Barley (acres)	Hay (acres)	Potatoes (Irish) (acres)
1900	294,949	120,952	85,256	21,949	952,214	44,075
1890	126,999	87,959	119,310	12,086	481,621	31,454

Year	Dairy Cows	Meat Cattle	Horses	Mules and Asses	Sheep	Swine
1900	100,116	1,333,202	236,546	12,297	1,352,823	101,198
1890	76,948	640,913	155,170	7,139	717,990	64,358

MANUFACTURES. Manufacturing yields precedence to mining and farming, although 4.6 per cent. of the population is engaged in this occupation. But manufacturing is growing, owing to a combination of favorable circumstances, chief of which is abundance of raw materials. This State produces more coal than any other State west of the Mississippi River, and, excepting Minnesota, three times as much iron ore as all of these States combined, consequently a large amount of coke, iron, and steel products is manufactured. The presence of coal makes possible the smelting and refining of copper and lead ores, which has rapidly developed, these ores being imported from neighboring States for such purposes. Further advantage is given the

State from the more extensive development of its railways and its position as a distributing centre. In those manufactures in which freight rates are an important consideration, Colorado's great distance from the manufacturing centres of the East is another advantage. The foundry and machine-shop products, which have had a rapid growth during the past decade, consist largely of mining machinery, in the production of which the State holds high rank. An increase in the flouring and the meat-packing industries is a natural consequence of the growing importance of agriculture. The following figures from the census of 1890 and of 1900 show the number of establishments and wage-earners, and the value of the total gross product for these years:

\$795,000 resources and \$524,000 deposits. No savings banks were reported.

CHARITABLE AND PENAL INSTITUTIONS. There are an insane asylum at Pueblo and a soldiers' and sailors' home at Monte Vista. The State also maintains homes for its deaf and blind and for its dependent and neglected children. Boards of county commissioners make annual appropriations for the support of the poor, county homes being provided in some counties. There is a State penitentiary at Cañon City. The entire expense of maintaining the institution from 1876 to 1900, inclusive, was \$2,296,899. The earnings of the prison during the same period were \$516,333. Much of the labor of the convicts has been on roads and irrigation ditches. The State has an indeterminate sentence and parole law. First

INDUSTRIES	Year	Number of establishments	Average number of wage earners	Value of products, including custom work and repairing
Total for selected industries for State.....	1900	633	8,261	\$23,664,719
	1890	403	5,256	16,064,081
Increase, 1890 to 1900.....		230	3,005	7,600,638
Per cent. of increase.....		57.1	57.2	47.3
Per cent. of total of all industries in State.....	1900	17.7	33.4	23.0
	1890	26.5	35.0	37.8
Coke.....	1900	9	406	1,213,561
	1890	7	247	673,479
Foundry and machine-shop products.....	1900	77	1,823	3,986,915
	1890	31	751	1,792,619
Car and general shop construction and repairs by steam railroad companies.....	1900	29	2,687	3,141,602
	1890	10	1,366	1,965,696
Flouring and grist mill products.....	1900	60	278	4,528,062
	1890	33	246	3,898,166
Liquors, malt.....	1900	14	323	2,042,863
	1890	11	236	1,601,168
Lumber and timber products.....	1900	159	732	1,627,605
	1890	120	1,156	1,363,749
Printing and publishing.....	1900	278	1,800	3,561,754
	1890	187	1,177	2,641,174
Slaughtering and meat packing, wholesale.....	1900	7	212	3,562,357
	1890	4	77	2,128,030

TRANSPORTATION AND COMMERCE. Colorado has better railroad accommodations than any other Rocky Mountain State. In 1899 there were 4616 miles of track, most of which was constructed prior to 1890. The Union Pacific, Missouri Pacific, Atchison, Topeka and Santa Fé, the Denver and Rio Grande, the Colorado and Southern, and the Rock Island Route, with their branches, are the principal railroads. These railroad facilities are important, not only in developing the resources of the State, but in augmenting its commercial importance by making it a collecting and distributing centre for the West. There are no navigable streams.

FINANCES. In 1900 the total debt of the State was \$2,700,000. The total receipts and disbursements for the two years ending November 30, 1900, were respectively \$3,199,000 and \$3,089,000.

BANKS. In October, 1900, there were 40 national banks in operation, with a capital stock aggregating \$4,387,000, the outstanding circulation being \$3,337,000; deposits, \$24,500,000; and reserve, \$10,900,000. In July of the same year there were 30 State banks, with \$9,800,000 total resources, \$1,430,000 capital and \$8,100,000 deposits. There were also 13 private banks with

offenders between the ages of sixteen and thirty are sent to the State Reformatory at Buena Vista, where the cultivation of a farm is the chief occupation. The parole system is used at this institution. The State also has an industrial school for youthful offenders at Golden. It is without 'locks, bars, and cells,' and endeavors to treat its wards as students, not as criminals. Each of the charitable and penal institutions is under the jurisdiction of a board of control. The State Board of Charities and Correction is an inspecting and advising body.

POPULATION. Colorado is the most populous of the Rocky Mountain States. The following gives the population by decades: 1860, 34,277; 1870, 39,864; 1880, 194,327; 1890, 412,198; 1900, 539,700, of which only 10,654 were colored. The foreign born in 1900 numbered 91,155, about one-half of whom came from the United Kingdom and Canada. In 1880 two-thirds of the population were males, but with the development of agriculture and more settled conditions of life the population is rapidly becoming normal; in 1900 the male population constituted less than 55 per cent. of the total. There is a marked tendency to segregate in towns, as is usual in

mining regions. There are eight places of over 4000 inhabitants, constituting 41 per cent. of the population. Three Representatives are sent to the Lower House of the National Congress.

The principal cities of the State are Denver, the capital, with a population (1900) of 133,859; Pueblo, 28,157; Colorado Springs, 21,085; Leadville City, 12,455; Cripple Creek, 10,097.

RELIGION. Numerically, the Roman Catholic Church ranks first. Of the other denominations, the Methodist and Presbyterian are the strongest.

EDUCATION. Colorado maintains a high standard of education. But six States have a longer school year, and none of these are west of the Appalachians. Seventy-six per cent. of the population between the ages of six and twenty-one are enrolled in the public schools. High school advantages are provided in the towns. The teachers receive higher salaries than those generally paid in the West. Women are eligible to school district boards and may vote at school elections. There is a normal school at Greeley. Higher institutions of learning are: Colorado College, established at Colorado Springs in 1874; University of Colorado, opened in Boulder in 1877; School of Mines at Golden, and School of Agriculture at Fort Collins; Presbyterian College at Del Norte; Denver University; also Rocky Mountain University and College of the Sacred Heart at Denver. There are medical schools at Boulder and Denver. The enrollment for all higher institutions of learning is about 2300. The National Government has an Indian school at Grand Junction.

GOVERNMENT. The Constitution was adopted by a vote of the people August 1, 1876. By a two-thirds vote of each House, a proposed amendment may be referred to popular vote; but amendments must be voted upon separately. A proposal for a constitutional convention may also be referred to the people by a two-thirds vote of each House, and if a majority of the people approve, the next session of the Legislature must provide for such convention. It must consist of twice as many delegates as there are members of the Senate, and the Constitution drawn up must be submitted to the people for ratification. The Constitution specifies a six months' residence in the State as a prerequisite to voting, and authorizes the Legislature to make other time requirements. Either sex may vote at school-district elections, or hold school-district offices. Suffrage rights may be further extended to women by legislative enactment approved by a vote of the people. In the State elections in 1893 the people voted in favor of woman suffrage. An educational qualification may be imposed by law. The rights of citizenship can be denied an individual only during a period of imprisonment.

LEGISLATIVE. State elections are held on the first Tuesday in October of even years, and the Legislature meets on the first Wednesday of the following January. Senators and Representatives are elected for terms of four and two years respectively. The aggregate number of Senators and Representatives can never exceed 100. No bill can be so altered or amended on its passage through either House as to change its original purpose. Revenue bills must originate in the House of Representatives. Ordinary expenses only can be included in general appropriation

bills. A member cannot vote on a bill in which he has a personal or private interest. Impeachment charges are brought by the House, and tried before the Senate.

EXECUTIVE. The executive officers are a Governor, Lieutenant-Governor, Secretary, Auditor, Treasurer, Attorney-General, and Superintendent of Public Instruction, the term of each being two years. Their salaries are determined by law, and neither Treasurer nor Auditor can be his own immediate successor. A two-thirds vote of both Houses overrules the veto of the Governor. The Governor may veto any item of a money appropriation bill. He may grant reprieves, commutations, and pardons, and convene the General Assembly in special session. The Lieutenant-Governor, who is President of the Senate, succeeds to the Governorship in case of vacancy, and he in turn is succeeded by the President pro tem. of the Senate and by the Speaker of the House.

JUDICIAL. The judicial power of the State as to matters of law and equity, except as in the Constitution otherwise provided, is vested in a supreme court, district courts, county courts, justices of the peace, and such other courts as may be provided by law. There are three supreme court judges, elected for nine years; the district judges—one or more for each judicial district—elected for six years; and a judge for every county, elected every three years. A district attorney is elected triennially in every judicial district.

LOCAL GOVERNMENT. Three county commissioners (five in counties exceeding 10,000) are elected in every county, the term of office being three years. Other county officers, elected on the first Tuesday in October of the odd years, are: clerk, sheriff, coroner, treasurer, superintendent of schools, surveyor, and assessor. At the same election the small precincts elect one justice of the peace and the constable, and precincts of over 5000 a proportionately larger number. Towns and cities may be classified into not more than four classes, and the powers of each class may be defined by general laws.

MILITIA. There are two regiments of infantry of 550 men each, a squadron of cavalry with 200 men, and a battery of artillery with 75 men. The males of militia age number (1900) 142,000, 60,000 being liable to military duty.

HISTORY. Prehistoric remains, consisting of numerous cave-dwellings and the ruins of extensive pueblos, similar in character to those discovered in New Mexico and Arizona, have been found in southern Colorado. In the second half of the eighteenth century a number of expeditions into the limits of the present State were undertaken by the Spaniards. The most important of these was the one headed by Francisco Escalante, who in 1776 traversed the southwestern corner of the State, and explored the region of the Dolores and Gunnison rivers. But though Spain laid claim to the region, she made no attempt to settle it. The country, a portion of which was included in the Louisiana Purchase (1803), was partially explored in 1806 by Lieutenant Pike, of the United States Army, and in 1819 by Colonel Long. Further exploration was carried on by Frémont in 1842 and 1844, and before the Mexican War fur-trading stations had been built on the Arkansas and Platte rivers. In the Treaty of Guadalupe-Hidalgo (1848) Mexico relinquished her territorial rights

in favor of the United States. Parties of prospectors and emigrants from Georgia and Kansas entered Colorado in 1858. In 1859 the discovery of gold near Boulder and Idaho Springs was followed by a large immigration and the sudden rise of the mining towns of Denver and Boulder. After sending representatives to the Legislature of Kansas, 'Arapahoe County,' as the region was then called, together with lands taken from Nebraska and New Mexico, was organized into the Territory of Colorado on February 28, 1861. From 1864 to 1870 wars were carried on with the Cheyenne and Arapaho Indians. The Utes ceded the mountain and park regions between 1863 and 1880. In 1864 and 1868 unsuccessful attempts at organizing a State Government were made. The final enabling act was passed by Congress on March 3, 1875, and on August 1, 1876, Colorado, the Centennial State, was admitted into the Union. Gold-digging was on the decline in 1878, and many mining towns were being deserted, when it was discovered that from the masses of carbonates thrown aside by the gold-seekers, silver and lead might be extracted. Immigrants flocked to Leadville, and soon the value of the lead and silver output came to be many times that of the yield of gold. As a result, the people of the State, in 1892, declared enthusiastically for the free coinage of silver at the ratio of 16 to 1. Serious strikes broke out among the miners in 1894 and 1896-97, and recourse was had to military force to restore order. From 1876 to 1888 Colorado was Republican in national politics, but in the three Presidential elections after 1888 the silver interests of the State made it decidedly Democratic. In 1896 and 1900 especially, the Democrats; Populists, and Silver Republicans, in fusion, controlled a large proportion of votes in the State.

TERRITORIAL GOVERNORS

William Gilpin.....	1861-1862
John Evans.....	1862-1865
Alexander Cummings.....	1865-1867
A. C. Hunt.....	1867-1869
Edward McCook.....	1869-1873
Samuel H. Elbert.....	1873-1874
Edward McCook.....	1874-1875
John L. Routt.....	1875-1876

STATE GOVERNORS

John L. Routt.....	Republican.....	1876-1879
Frederick W. Pitkin.....	".....	1879-1883
James B. Grant.....	Democrat.....	1883-1885
Benjamin H. Eaton.....	Republican.....	1885-1887
Alva Adams.....	Democrat.....	1887-1889
Job A. Cooper.....	Republican.....	1889-1891
John L. Routt.....	".....	1891-1893
David A. Waite.....	Populist and Democrat.....	1893-1895
Albert W. McIntire.....	Republican.....	1895-1897
Alva Adams.....	Dem. and Silver Rep.....	1897-1899
Charles S. Thomas.....	Dem., Pop. and Silver Rep.....	1899-1901
James B. Orman.....	".....	1901-1903

Consult: Bancroft, *History of the Pacific States*, vol. xx. (San Francisco, 1890); Hayes, *New Colorado and the Santa Fé Trail* (New York, 1880); Pabor, *Colorado as an Agricultural State* (ib. 1883); Fossett, *Colorado: Its Gold and Silver Mines, etc.* (ib. 1880); *The Resources, Wealth, and Industrial Development of Colorado* (Denver, 1883).

COLORADO. A town and the county-seat of Mitchell County, Tex., 245 miles west by south of Dallas. on the Colorado River and on the Texas and Pacific Railroad (Map: Texas, D 3). It is the commercial centre of an agricultural and stock-raising region, with a consider-

able trade in cattle and hides, and has also extensive salt-works. Population, about 2000.

COLORADO, *Sp. pron.* kō'lō-rá'pō. A name given by the Spaniards to various unrelated tribes in different parts of Spanish America, including Texas, owing to their custom of painting the body with red pigment. Of the tribes thus known, one of the most noted was that of the Sacchas, 'men,' as they call themselves, of whom a few still survive in the upper valleys of the Daule and Chones rivers, in northwestern Ecuador. They go naked, and are naturally light-skinned, almost blond, but paint their whole bodies with a red paint. They belong to the Barbaecan stock.

COLORADO, UNIVERSITY OF. An institution of higher learning, situated at Boulder, Colo. It was incorporated by the Territorial Legislature in 1861, and in 1876 the Constitution of Colorado provided for its erection as a State university. At the formal opening of the institution, in 1877, it consisted of the college and a preparatory department. The Medical School was organized in 1883, the Law School in 1892, and the School of Applied Sciences in 1893. In 1902 the University of Colorado comprised the following colleges and departments: (1) The College of Liberal Arts, offering courses leading to the degrees of B.A., Ph.B., and B.S.; (2) the Graduate Department, conferring the degrees of M.A., M.S., and Ph.D.; (3) the Colorado School of Applied Science, conferring the degree of B.S. in civil, electrical, and mechanical engineering; (4) the School of Medicine, conferring the degree of M.D.; and (5) the School of Law, conferring the degree of LL.B. Women are admitted to the university on equal terms with men. The university library contains 25,000 volumes, besides pamphlets. The total registration in 1901-02 was 510, excluding the preparatory department. The university is maintained by a direct State tax, and its government is vested in a State board of regents.

COLORADO COLLEGE. An institution of higher education, founded in 1874 and situated at Colorado Springs, Colo. The college offers courses leading to the bachelor's degree in arts, science, and philosophy, and has an attendance of 650 students. There are also connected with the college a preparatory school and a conservatory of music, and a department of fine arts. The buildings include Palmer Hall, the library building, and a science building, erected, with its equipment, at a cost of \$350,000. The library numbers about 35,000 volumes. The institution has an endowment of \$450,000.

COLORADO DESERT. An arid region of southern California (Map: California, F 5). It extends from the eastern base of the coast ranges of San Diego County eastward to the Colorado River, and embraces the Coahuila Valley, which extends toward the northwest between the San Bernardino and San Jacinto Mountains. A considerable portion of the desert, including part of the Coahuila Valley, is below sea-level. At some prehistoric period part of this region was included in the Gulf of California, from which it was separated by the growth of the delta of the Colorado River. Later it formed the basin of a fresh-water lake, and in recent times a considerable portion of the area has been flooded from the river, so as to produce a temporary

shallow lake, known as Salton Sea. The Southern Pacific Railroad crosses the northern part of this desert and traverses the Coahuila Valley. The Colorado Desert is but a portion of the great desert region of the southwestern United States, which includes also the Yuma and Mohave deserts.

COLORADO, RIO, *rê'ô*. A river of Central Argentina, rising in the Andes and flowing southeast. It empties into the Atlantic in about latitude 39° 50' S. (Map: Argentina, E 11). Its entire length is about 700 miles, but it is navigable for light vessels for only a couple of hundred miles. The upper course is through a desert.

COLORADO RIVER. A large river flowing through the plateau region of the southwestern United States. It is formed in the southwestern part of Utah, by the junction of the Green River from the north and the Grand from the northeast, the former rising in southwestern Wyoming and the latter in the north central part of Colorado. Both of these headstreams receive numerous tributaries from the well-watered regions of the Rocky Mountains. Below their junction, the Colorado passes through what is in some respects the most remarkable region on the earth, not only for its natural scenery, but also for the great interest which it possesses for geologists, as it gives on a grand scale the clearest exemplifications of the action of erosive forces in shaping the contour of the land. In the Eocene epoch the whole region of Arizona, Utah, and Nevada was subjected to a vast upheaval, and what was formerly the bottom of the ocean was raised to a height of more than 10,000 feet above sea-level. This region, consisting chiefly of horizontal strata of the Paleozoic and Mesozoic systems, was subjected to extensive denudation by wind and water, and again to successive upheavals accompanied by volcanic action. In the northwestern part the strata were faulted into huge blocks, running north and south, giving the present shape to the mountains of Nevada. The result of the uplifting and erosion was the washing away of the weaker and softer strata, especially to the west of the present course of the Colorado, while those rocks that were protected by harder layers were left standing as extensive plateaus with precipitous escarpments. In some places lavas had been thrust up through the strata by volcanic action, and these localities are now marked by the isolated *mesas* so characteristic of the country. Since this region is almost or quite rainless below an elevation of 8000 feet, denudation proceeds slowly except along the river-courses, where chasms or cañons are cut deeply into the rock foundations. Such is the case with the Colorado and all the tributaries from its headwaters to the great escarpment called the Grand Wash, on the western boundary of Arizona.

The largest and deepest of these is the famous Grand Cañon, where the Colorado cuts through the Kaibab and Unikaret plateaus, from 7000 to 9000 feet high, in the northern part of Arizona. The cañon is five to six miles wide at the top and 5000 to 6000 feet deep, falling in several successive escarpments, indicating pauses in the upheaval of the plateau. In the middle is the narrow and gloomy cañon proper, with a sheer precipitous depth of 2000 to 3000 feet, at the

bottom of which rushes the river. The length of the Grand Cañon is over 200 miles. After the river emerges from the cañon it turns abruptly south, and, forming the western boundary of Arizona, it flows through a low desert region, receiving almost no tributaries, and diminishing in volume by evaporation and absorption. Leaving United States territory near its mouth, it empties into the Gulf of California. The total length of the river is about 900 miles, and with the Green, 2000 miles. It is navigable for light steamers for several hundred miles from its mouth, but navigation is much impeded by rocks and sand-bars, as well as by the ever-changing volume of its water and the shifting of its bed. The river was discovered in 1540 by Fernando Alarcón, and the perilous descent through the cañon was first made by James White in 1867. Valuable additions to geological science have resulted from expeditions into the cañon, conducted by the United States Geological Survey. See J. W. Powell, *Exploration of the Colorado River of the West and its Tributaries*; and Dutton, *Tertiary History of the Grand Cañon of the Colorado*, *Monograph II., United States Geological Survey, 1882.*

COLORADO RIVER. A river rising in the western part of Texas, near the southeastern boundary of New Mexico (Map: Texas, F 5). It flows in a generally southeast direction across the State, and empties into the Gulf of Mexico through Matagorda Bay. It receives a number of tributaries, chiefly from the south; among these are Sulphur Creek, and the Concho, San Saba, and Llano rivers. The chief towns on its course are Bay City, Wharton, Columbus, Lagrange, Bastrop, and Austin. It is about 900 miles long, and in winter is navigable for river steamboats to Austin.

COLORADO SPRINGS. A city and county-seat of El Paso County, Colo., 73 miles south of Denver; on the Atchison, Topeka and Santa Fé, the Denver and Rio Grande, and other railroads (Map: Colorado, E 2). Its location, 6000 feet above the level of the sea, near the base of Pike's Peak and the celebrated mineral springs at Manitou, with a healthful climate, have combined to make the place a much-frequented resort. It is the seat of Colorado College, founded in 1874, and of State institutions for the deaf-mute and blind. Settled in 1870, Colorado Springs was incorporated in 1872, and is governed under a charter of 1878 (revised 1901), which provides for a mayor, chosen biennially, and a city council, elected by wards. Standing and special committees are appointed by the Mayor; also the chief and members of the fire department, members of the police department, market master, street commissioner, and health officer. Other offices are filled by the council. The water-works are owned and operated by the municipality. Population, in 1890, 11,140; in 1900, 21,085.

COLORADO STATE AGRICULTURAL COLLEGE. A scientific school of agriculture, situated at Fort Collins, Colo., organized in 1876. The college received 90,000 acres of the lands granted to the State in 1862, and since its inception has been supported chiefly by a State tax. Its gross income is about \$100,000. It offers courses leading to the B.S. and M.S. degrees. Women are admitted on equal terms with

men. The library contains about 11,000 volumes. The attendance is over 350.

COLORATION IN ANIMALS. See BIRD; INSECT; PROTECTIVE COLORATION; MIMICRY.

COLOR-BLINDNESS, ACHROMATOPSIA, OR DALTONISM. An incurable defect of vision, owing to which some persons are unable to distinguish certain colors. The name Daltonism is after Dalton, the English chemist, who suffered from the defect. Acquired color-blindness is a symptom of diseases of the optic nerve and retina. Congenital color-blindness usually affects both eyes, and is often hereditary. It is found in from 3 to 4 per cent. of men and less than 1 per cent. of women. It occurs in eyes whose power of vision is otherwise (as to form and distance) perfect. It is usually partial, being a failure to distinguish one or two of the fundamental colors—red, green, and blue. The eyes of persons having this defect of vision have been carefully examined after death without the discovery of any peculiarity. Color-blindness therefore has its seat in the sensorium, not in the visual apparatus. The Hering theory is that the retina contains three pairs of visual materials—white-black, red-green, and blue-yellow. Color-blindness is accounted for by the supposed absence of one or two of these substances. According to the Young-Helmholtz theory, there are three primary color-perceptions—for red, green, and violet. In the absence of one of these, a color appears composed of the others. The most common forms of color-blindness are red blindness, green blindness, and red-green blindness. To detect the defect, the method of having the patient name colors is not satisfactory, because colors may be differentiated by apparent differences of brightness. Professor Holmgren of Upsala, Sweden, devised a series of test wools which furnish the best means of recognizing defects. These are skeins of wool of certain colors ('test colors'), various tints and shades of the same colors, and so-called 'confusion colors.' When the patient attempts to match the colors with the other skeins, the confusion colors are often added also, and it may be noticed that there is some hesitancy in making the selections.

The question has received serious legislative attention, and in most of the States of the Union stringent laws have been passed regarding the examination of the vision of all who depend on colors for their guidance. It is a crime in color-blind persons to pursue any calling when their defect, known to them, is liable to injure others, and it might be added that it is foolish for a color-blind painter, tailor, or milliner to attempt to compete with those who have perfect vision.

The safety of the traveling public depends in large measure upon the accuracy with which green or red signals are observed by employees of railways and ships. Yet in but few countries is the matter of examination of color-sense demanded by statute. In Sweden, since 1877, only men with normal color-vision have been employed in the railway service. In Holland the Government controls the matter efficiently. In Italy, while there is no special law, the employees are tested. In France, in the absence of law about examination, Holmgren's test is usually employed. In Germany examination of color-sense is prescribed by law. In Austria, on the State

railroads, examination is made. In England there is no Government regulation, and the tests employed by certain companies are inefficient. Only three of the States of the United States—Ohio, Massachusetts, and Alabama—have enacted laws to control the matter. In some other States the railroad commissioners formulate regulations requiring the examination of employees, as in New York State. That the traveling public does not demand stringent laws compelling examination of color-sense in all countries is astonishing, and can be explained only by the fact that the prevalence of color-blindness and the possibility of its detection have been understood by the people only since 1875. In 1892 there were employed by the different railroad companies of the United States a total of 821,415 men, while the number of miles of railroad reached 171,563.25. Accepting 3.69 as the percentage of color-blindness among men, the startling number of 30,310 color-blind men were in positions of some sort among the employees mentioned. In some cases the proportion of employees with color-blindness is very small, owing to the adoption by companies of adequate tests and the proper selection of men. In 1880 the officers of the Pennsylvania Railroad invited Dr. William Thomson, professor of ophthalmology in Jefferson Medical College, Philadelphia, to advise and assist them in the examination of the sight of their 40,000 employees, scattered over more than 5000 miles of track, of whom 12,000 were actually dependent upon colored signals for their guidance. A system was devised by which men attached to each division of the road were examined, each in his own locality, by intelligent laymen, with Holmgren's skeins, arranged on what is called 'Thomson's stick,' and the cooperation of employees was secured. Reports were sent to the surgical expert, whose decision, after a final examination, was decisive. About 4.2 per cent. were found defective in color-sense. At a later examination, of 25,158 men, only 481, or about 2 per cent., were found color-blind, many men having left the company's employ before being detected, thus being able to secure positions on roads not requiring color-tests. In 1887 the same system of examination was adopted by the Philadelphia and Reading Railroad, with about 15,000 employees on 2200 miles of track, after a serious conflict between officials and employees, which was settled by Dr. Thomson. Of these men, 3.5 per cent. were declared color-blind. The Midland Railway and the London and Southwestern in England adopted the same method. In 1896, from responses to a circular addressed to one hundred of the most important railroad corporations of the country, controlling in all 129,970 miles, inquiring if examinations were made as to color-blindness of employees, it was learned that 35 roads, controlling 54,465 miles, were using Thomson's or other methods; 31 roads, controlling 29,428 miles, were making no test. No reply was received from 34 roads, controlling 46,077 miles. The New York Central Railroad began examining its employees about 1890, requiring them to report for tests of sight at either New York or Buffalo at stated times. This method being found disadvantageous, two physicians were employed about 1899, whose duty it is to travel over the system, examining and reexamining the men from time to time in their own localities.

This road, in June, 1901, employed about 40,000 men, and controlled 7137.31 miles of track, inclusive of the leased lines, such as the New York and Putnam; West Shore; Fall Brook; Boston and Albany, etc.; but exclusive of the great lines, such as the Lake Shore and Michigan Southern, included in the 'Vanderbilt system.'

Consult: Holmgren, *De la cécité des couleurs* (Sweden, 1877); Joy Jeffries, *Color-Blindness* (Boston, 1879); Swanzy, *Diseases of the Eye*, appendix i. (Philadelphia, 1896); and Thomson and Weiland, "Detection of Color-Blindness," in Morris and Oliver's *System of Diseases of the Eye*, vol. ii. (Philadelphia, 1897).

COLORED HEARING, or **CHROMÆSTHESIA**. The anomalous association of colors with sounds. It is the commonest type of synæsthesia, or the formation of unusual connections between sensations of different sense departments. While colored hearing is relatively frequent (statistics record one person in eight), it is exhibited in very varied forms. These may, however, be grouped, in the first place with regard to the nature and intensity of the photism (the color which is induced), and secondly with regard to the nature of the inducing sound. The induced color may, in rare cases (see works of Gruber and Whipple, indicated in the bibliography at the end of this article), be of hallucinatory intensity, so as to be seen objectively when the eyes are open. Usually the intensity is less—the photism is localized (Flournoy), though not projected. In the third grade the photism is 'imagined'—the color is really present as a visual sensation, but has no definite place; e.g. all soprano voices may be white, all tenor voices green. Fourthly, photisms may be simply 'thought,' no visual sensation being present. Finally, certain persons possess 'negative photisms'—they cannot say what color a sound has, but can say what colors it 'ought not' to have. Any auditory impression may serve as the inducing agency. The sources may, therefore, be grouped, for convenience, as (1) musical tones and noises (subdivided into single notes, chords and discords, musical selections, etc., each with further arrangement according to pitch, intensity, clang-tint of instrument), and (2) articulate speech (vowels, consonants, words, sentences).

Can we find any uniform relation between these two series of variables, the inducing sound and the induced color? Certain investigators, using the questionnaire method, have answered in the affirmative. Thus, Bleuler and Lehmann that "sharply demarcated, small, bright, or pointed photisms are aroused by high-pitched sounds. Red, yellow, and brown are frequent colors; violet and green are rare; blue stands midway in frequency. The tendency to secondary sensations (synæsthesia) is inheritable." Other investigators (e.g. Whipple), who have made detailed experimental studies of a few individuals, contend that the questionnaire method is inadequate, and that there is a considerable degree of variation, not only between individuals, but also for the same individual at different times, so that "generalization is at present to be avoided."

The explanation of colored hearing is usually found in the persistence in adult life of certain curious and useless connections between sensations. Childhood is characterized by the forma-

tion of countless mental combinations. Of these, only the useful or meaningful normally survive. The persistence or recrudescence in the mature individual of anomalous though not abnormal auditory-visual connections is the condition of chromæsthesia. The association may be direct (habitual or specific connection of sensations) or indirect (connections of sensations through the organic complex embodied in a feeling). The absence of abnormality is attested by the facts that colored hearing is no more frequent among neurotic than among normal individuals, and that the associations do not interfere with mental operations. They may, indeed, furnish positive sources of pleasure to their possessor.

Consult: Bleuler and Lehmann, *Zwangsmässige Lichtempfindung durch Schall* (Leipzig, 1881); Flournoy, *Les phénomènes de synopsie* (Paris, 1893); G. M. Whipple, *American Journal of Psychology*, vol. vi. (Worcester, 1900); Gruber, *L'audition colorée et les phénomènes similaires* (Paris, 1892).

COLORED METHODIST EPISCOPAL CHURCH OF AMERICA. See **METHODISM**.

COLOR-GUARD. A military escort for regimental colors. (See **COLORS**.) Formerly a position of great honor and considerable danger, when on active service; now used only on regimental parades, reviews, and inspections. The United States Infantry Drill Regulations define the composition of a color-guard as "one sergeant, who is the color-bearer, and two experienced soldiers, selected by the colonel."

The color is kept at the office or quarters of the colonel, unless required on parade, in which case it is escorted by the color-guard, marching in one rank, the color-bearer in the centre. It is returned in like manner.

COLOR PHOTOGRAPHY. The reproduction by photography of natural objects in their own colors. There is no means known at present by which, using ordinary photographic processes, this is possible. When a photograph is taken with a camera and a sensitive plate, the developed negative shows an image of the object in various shades of gray, which depend upon the sensitiveness of the photographic plate to the ether-waves characteristic of the colors of the natural object. It is possible so to stain a photographic plate that it is more or less sensitive to all colors; but the developed negative is always gray, except possibly for certain accidental colors which have not the faintest connection with those of the object photographed. To reproduce the colors, therefore, other methods are essential, and there are at the present time two quite distinct processes.

One of these is based upon the work and a suggestion of Prof. J. Clerk Maxwell (1831-79), of the University of Cambridge. He showed that if there were produced simultaneously in the normal eye three sensations—viz. definite shades of blue, green, and red—the eye could be made to perceive any desired color of the spectrum by properly adjusting the intensities of these three component sensations. Thus, if by any means—e.g. by sets of mirrors—the eye can be made to see at one time three ordinary photographs of any natural object, looking at one through a piece of red glass, another through a piece of green glass, and the third through a piece of blue glass, the

eye will see the object in its natural colors, provided the intensity of the deposit of silver on the original three negatives is so adjusted for each negative that the intensities of these red, green, and blue sensations are exactly such as to produce the proper color-sensations. To secure this intensity on the photographic plates, three photographs of the object must be taken, each through such a colored screen as will transmit enough light of all wave-lengths to produce the desired result on the plate. Thus, one plate is exposed in a camera in front of which is a screen which allows to pass a great deal of red and small amounts of yellow and green; the second is exposed with a screen which is transparent to the green and slightly to yellow and blue; the third is exposed with a screen which is transparent to blue and slightly to green and violet. It is a question of the most careful experimenting to find what photographic plates should be used, and what colored screens give the proper intensity with them.

There are three processes of color photography based upon this general idea. In the Ives process, the three photographs of identical sizes are taken simultaneously on three plates, each through its proper 'taking' screen. From these three negatives, three positives are made by contact; and these positives, each with its proper 'viewing' screen of pure red, green, or blue, placed in a so-called 'kromskop' in such a manner that sunlight is reflected through them and their screens, and all three pictures are seen superimposed apparently on each other. In another process invented independently by Professor Joly, of Dublin, and Mr. McDonough, of Chicago, the three colored screens through which the photographs are taken are combined by having a series of lines of these three compound colors ruled very closely together on a piece of glass, every fourth line having the same color. A single photograph is taken through this composite screen; a positive is taken of this, and a viewing screen, consisting of a series of lines, one a pure red, the next pure green, the next pure blue, with the same spacing as in the taking screen, is superimposed on the positive, so that the colored lines come in exactly the proper positions; and this compound plate is used as a transparency by holding it up to the light, or by looking through it at a piece of white paper which is brightly illuminated.

Quite a different process, although of the same general principle, has been invented by Professor Wood, of Johns Hopkins University. It depends for the production of the pure colors, red, green, and blue, upon the phenomena of diffraction gratings (q.v.), by means of which white light may be dispersed into pure colors. It is necessary to have three gratings ruled on glass, with grating spaces such that one gives the same deviation for the green as the other two do for the red and blue respectively. Three negatives are taken of the natural object, each through its own compound color screen; on these the three glass gratings are superimposed each on the proper one; positives are then taken through these compound negatives: the three images being superimposed by suitable lenses, thus forming a composite positive of the natural object overlaid with parallel lines suitably spaced and placed. By viewing a source of white light through this plate and using proper optical means, the object will be seen in its natural

colors, the dispersed colors of the three gratings serving in place of the viewing screens of the former processes.

An entirely different physical principle is made use of in the Lippmann method of color photography; it depends upon the fact that the colors seen by the eye are caused by ether-waves of different wave-number; and so, under proper precautions, it is possible to have 'stationary vibrations,' so called, produced. If one vibrates rapidly the end of a long rope, the other end of which is fastened to a wall, waves are sent along the rope; reflected waves are produced; and, as the direct and reflected waves are thus superimposed, there are certain points, regularly spaced, where the two waves neutralize each other's action, while in between these 'nodal' points the string vibrates exactly as if it were an ordinary string stretched between two fixed pegs. This is called a stationary vibration; and the distance between two nodal points equals half the wave-length of the train of waves which is the original cause of the vibration. The same phenomenon may be produced by ether-waves if allowed to fall upon a mirror. In Lippmann's process a photographic plate of particularly fine grain is placed so as to form one side of a bath containing mercury, the film side being away from the mercury. If light of a definite color falls upon the photographic plate, the waves enter the film, reach the mercury, are reflected, and form stationary vibrations. In between the nodes there will be chemical action, which is thus confined to plane surfaces, parallel to each other and very close together, their distance apart depending upon the wave-number of the light. If this photographic plate is now suitably developed, the nodal planes will be dissolved out largely, thus forming of the film a pile of parallel plates at minute intervals. If such a pile of plates is viewed with white light, it will appear to be of the same color as that of the light which produces the chemical action, owing to the phenomena of interference (q.v.). Similarly, if the colored light from any natural object falls upon the film in its original condition, each color will produce its own stationary vibration and its own set of parallel planes, where there is chemical action; and so, when developed and viewed in white light, the image will have the proper colors of the object itself. (The above explanation of the Lippmann process is not complete; it offers but a rough idea as to what takes place. In fact, a satisfactory explanation of all the phenomena is not known.)

To print in the natural colors the photograph of any colored object is perfectly possible by a simple modification of the method of Ives or of Joly-McDonough, which will be found discussed under THREE-COLOR PROCESS. For additional information upon the subject of color photography, the reader may consult: Wood, *Philosophical Magazine*, vol. xlvii. (London, 1899); Joly, *Nature*, vol. liii. (London, 1895-96); Lippmann, *Proc. Royal Society of London*, vol. lx. (London, 1896); Wiener, *Smithsonian Report* (Washington, 1896); Bolas, Tallent, and Senior, *A Handbook of Photography in Colors* (New York, 1900).

COLOR PRINTING. See THREE-COLOR PROCESS; LITHOGRAPHY.

COLORS, MILITARY AND NAVAL. The term applied to the national flag or ensign wherever

it is displayed and also to other flags, banners, or guidons carried by military bodies, and usually indicating their designation. Emblems, banners, or simular devices have been in use among soldiers and sailors from remotest antiquity. They have been conspicuous in the past for their great moral as well as practical value to the troops carrying them. The older, and more historic the colors, the greater their moral value; for the soldiers of succeeding generations would vie with each other in maintaining their traditions, and adding to their glory, with the result that many of the greatest exploits of military valor have been born of this desire. In practice they were the rallying-point of the organization, the embodiment of its history, and the material symbol of headquarters. They have been in use in every army and in every age up to comparatively recent times, when they have been displaced by the necessities of modern scientific warfare. They still retain their historic value, however, and to a certain extent their moral value also. With the British, infantry colors were originally known as *ensigns* (q.v.), each company carrying its own color. This soon gave way to the system at present in use, whereby each regiment or battalion is supplied with a royal or King's color, and a regimental color. The former is a *Union Jack* and the latter a flag of the same color as the facings (q.v.) of the regiment, with the blue union in the corner and the title, number, and honors of the regiment embroidered upon its folds. Both colors are made of silk, measure about three feet nine inches by three feet, and are each mounted on a pole of about eight and a half feet in length. Cavalry regiments of the Guard carry oblong *standards*, and dragoon regiments, *guidons*. Both types are made of crimson silk. The Royal Artillery, Royal Engineers, Lancers, Hussars, and Rifle regiments do not carry colors. Since the Zulu War of 1880, British troops no longer take their colors with them when on active service. See *ENSIGN*.

The colors carried in the United States Army by the various regiments and battalions are two in number, the national flag (see *FLAG*) and the regimental color, both of which are of prescribed size and form for the various arms of the service. The battalions of engineers carry the national flag, with the title of the battalion embroidered in silver on the centre stripe; and the battalion color, of scarlet silk having in the centre a castle, with the number of the battalion placed above the castle, and the words "U. S. Engineers" below. The artillery corps have similar colors, on which the corps device of two crossed cannon are emblazoned. Infantry regiments have the same national color as artillery and engineers; the regimental color being of blue silk, the coat of arms of the United States embroidered in silk on the centre, beneath the eagle, a red scroll with number and name of regiment embroidered in white; cavalry standards in size are somewhat smaller than those carried by the infantry and consist of a national flag made of silk. The regimental standard is of yellow silk, with the coat of arms of the United States embroidered in silk on the centre, beneath the eagle a red scroll, with number and name of regiment embroidered in yellow, fringe yellow.

According to the *United States Army Regulations* (1901, sec. 244) the national color will be

carried in battle (when it is invariably with the main body or reserve), campaign, and on all occasions of ceremony in which two or more companies participate. The regimental color is carried in like cases in battle and campaign, reviews and inspections. At other ceremonies it is carried only when specially ordered. The names of battles in which one or more companies of a regiment, or of the battalions of engineers, or of the artillery corps, have borne a meritorious part are engraved upon silver rings fastened on the pikes or lances of the colors. Each troop of cavalry and battery of field-artillery has a guidon (q.v.) on which the numbers or letters designating the command are inscribed. Camp colors are small flags used to mark the location of some particular corps, post, or other institution.

In naval usage colors play an equally important part. On board old-fashioned ships they are flown at the peak of the spanker gaff, but on recent ships a special flagstaff fitting in sockets at the stern is used for the colors. In port they are hoisted at 8 A.M. and kept hoisted until sunset. On board ships of the United States Navy when the colors are hoisted they are saluted by a call on the bugle, or the band, if there is one on board, plays the "Star-Spangled Banner." While the colors are going up and the bugle or band is playing all officers and men on the upper deck face aft and salute as the colors reach the head of the staff. Dipping the colors (i.e. lowering them a short distance and then hoisting them again) is a species of compliment or salute, but United States naval vessels are forbidden to dip their colors except in returning such a salute. Colors are half-masted to express mourning and hauled down to indicate surrender or submission. When colors are carried in a funeral procession they are draped with black crape.

COLOR-SERGEANT, sār'jent or sēr'- . In the United States Army, a non-commissioned officer of the rank of sergeant detailed for the color-guard (q.v.). In the British Army he is the equivalent, in rank, of the United States Army first sergeant, but formerly was one of the non-commissioned officers constituting the color-guard, from which fact the present title is derived.

COLORS OF THIN PLATES. See *LIGHT*, *Interference* and *Diffraction*.

COLOS'Æ (Lat., from Gk. *Κολοσσαί*, *Kolosai*, also spelled *Κολασσαί*, *Kolassai*). An ancient city of Phrygia in Asia Minor, on the river Lycus, a tributary of the Mæander. Colossæ was on one of the great ancient trade routes traversing Asia Minor, and is mentioned by Herodotus and Xenophon in such a way as to imply that it was at the time a city of considerable importance. Like its near neighbors, Laodicea and Hierapolis, it probably carried on an extensive trade in the dyed woolen goods for which the region was famed. In Roman times the town had lost a large share of its former importance. Christianity made its way to Colossæ in the days of Paul, not through his personal visitation, but probably through the evangelistic work directed during his long sojourn at Ephesus (cf. Acts xix. 10). During his first imprisonment at Rome Paul sent hither two letters, one addressed to the Church of Colossæ and the other to Philemon, an individual belonging to the church. (See *COLOSSIANS*; and *PHILEMON*.) During the third century A.D. the

town seems to have been insignificant, perhaps due to its not being able to recover from the great earthquake of about A.D. 60, which laid many towns in the neighborhood in ruins. Its place was taken by Chonæ, the modern Khonas, about three miles south of the ancient town.

COL'OSSE'UM. See AMPHITHEATRE.

COLOSSIANS, *kô-lôsh'i-anz* or *kô-losh'aniz*, EPISTLE TO THE (Gk. *πρὸς Κολοσσαίς*, sc. *ἐπιστολή*, *pros Kolossais*, to the Colossians, sc. *epistolê*, epistle). One of the New Testament group of Paul's Epistles. It is addressed to the Christians at Colossæ (q.v.).

It belongs, with Ephesians and Philemon, to a closely connected group of three writings of the Apostle, addressed to this same general region and produced within the same general time, evidently at Rome during the captivity mentioned in Acts. With Philemon it is connected by an identity of personal references; to Ephesians it is bound by a significant community of contents.

Its Pauline authorship has been vigorously assailed by such individual critics as Mayerhoff (1838) and Holtzmann (1872), and by such schools as that of Tübingen (1845)—the critics holding that it gives proof of a literary imitation of other writings (Ephesians) which prevents it from being considered genuinely Paul's; the school claiming that it betrays such a presence of second century Gnostic ideas as to make it necessary to assign it to that post-Pauline age. Neither of these contentions is accepted by the best scholars of the present time. As a matter of fact, assuming, as a working hypothesis, the claim involved in the Epistle's greeting that it was written by Paul, the document shows itself throughout so consistent with the claim as to make it critically impossible to deny its validity.

Within the circle of those who accept its Paulinity, however, the chief question among critics to-day concerns the nature of the errors opposed by the Apostle. From a careful study of the Epistle the following facts are apparent: (1) The errors had not so developed as to cause separation from the Church (the phrase in ii. 19 "not holding fast to the Head" could hardly be said of full separatists). (2) The teachers were Jews, and Jews of a Judaistic type (the references to circumcision in ii. 11 and to the ordinances of the law in ii. 14 show that Paul was opposing propagandists of a Jewish legalistic character). (3) At the same time they went beyond this type (see the mention of 'Drink' in the warning of ii. 16, an element which did not enter into the restrictions of the Judaizers; see also the designation of their position as being "according to the traditions of men," ii. 8, and "according to the precepts and teachings of men," ii. 22, which would not have been Paul's way of designating the Judaistic position that rested on the authority of the Old Testament law; notice also the absence of all antithesis between faith and works and of any insistence on legalism as necessary to salvation, which were characteristics of the Judaistic propaganda). (4) In fact, there are passages which seem to show these teachers to have been open to the influence of Essenism, though they do not show them to have been Essenes (e.g. ii. 20-23, which describes their regulations as an ascetic severity toward the body—*ἀσφειδία*—though asceticism is evidently not represented as practiced

as an end in itself, as it was with the Essenes; ii. 18, which shows them to have been given to angel-worship, a cult which was more consonant with Essenism than with the practice of Judaizers, though this worship was apparently accompanied by visions which were foreign to Essenism). (5) There are passages which seem to indicate the presence of Gnostic elements in these errors (e.g. ii. 2-9, which give us characteristic Gnostic terms such as "the *mystery* of God," "all the *fullness* of the Godhead," also ii. 10, which discloses the distinctive Gnostic idea of a graded series of supernatural beings, conceived of as emanations from God—"who is the head of all principalities and powers." This idea is repeated in verse 15—"having despoiled the principalities and powers"—and appears in various forms in the long passage i. 15-20, e.g. "the first-born of all creation"—"in Him were all things created, in the heavens and upon the earth, things visible and things invisible, whether thrones or dominions or principalities or powers"—"He is the head of the body, the Church, who is the beginning, the first-born from the dead," which latter passage, together with ii. 9-11, 15, 19, shows the significant emphasis placed by the Apostle upon the supremacy of Christ, in both the physical and the spiritual worlds, and the absolute essentiality of union with Him in order to foster spiritual life and well-being. This would combat the Gnostic tendency to subordinate Him to the category of these angelic emanations, which would thus seem to have been one of the Errorists' ideas). (6) These errors, moreover, while vague and indeterminate, appear to have had with these false teachers an inter-related form and to have been promulgated in a dogmatic way (cf. ii. 4, 8, 18), being held forth as a mystery for the initiated (ii. 2-3; iii. 3).

It would thus seem that these errors constituted a teaching of a more or less systematic kind, in which the underlying speculative principles were brought to bear upon the rule and habit of life; that it was something more than mere Judaism, even Judaistic Judaism; that, in its main features, it was influenced by the Essenic attitude of mind and possessed elements which appear in the Gnosticism of the second century. The great difficulty is in historically locating such a combination as is thus presented before us.

In the effort approximately to accomplish this locating it is to be remembered: (1) That, while these errors constituted a system of teaching, the system was not a fully developed one—at least Paul does not so treat it. (2) That Gnosticism was, in reality, an attempt to assimilate Christianity and philosophy, and that its philosophic element was a mystical rather than a logical one; so that we should be prepared to find the place of its beginnings in the East rather than the West. (3) That this attempt at assimilation was made on the principle of eclecticism, Gnosticism being, in fact, a combination of Jewish, Pagan, and Christian elements, the Jewish element being furnished by Essenism, the Pagan by Hellenic philosophy and Oriental theosophy, the Christian by the evangelistic preaching. (4) That Essenism, in particular, was a thoughtful tendency working in all Jewish minds, which, while never passing, as an organization, beyond Syria, where it originated in the second century

B.C., yet, as a dynamic influence, must have been more or less present throughout the Diaspora and was not likely to have been absent even from the Jewish membership of the Christian Church. (5) That, as this Essenic tendency came in contact with Eastern speculation, it fermented, and this fermentation, going on within the Christian Church and in contact with Christianity, produced the germs of Gnosticism.

Inasmuch, therefore, as this Epistle was sent to a church of the East, in the region where and at the time when the thoughtful Jew and the philosophic Greek and the theosophic Oriental were coming together—especially to this region of Phrygia, the Jews of which had been imported out of Babylon, and from which place they may have brought with them an Oriental habit of Jewish thought—it would seem as though we had in these Colossian errors a specimen of just that process of fermentation which produced the beginnings of Gnosticism.

The attempt of Harnack and others to consider the Apostle as referring to parish difficulties of a purely practical nature, devoid of all speculative elements, results from a superficial exegesis which does not take the Epistle seriously.

BIBLIOGRAPHY. *Commentaries:* A. Klöpffer (Berlin, 1882); J. B. Lightfoot (London, 1890); H. Oltramare, *Commentaire sur les épîtres de S. Paul aux Colossiens, aux Ephésiens et aux Philippiens* (Geneva, 1891-92, 3 vols.); H. v. Soden, in *Hand-Kommentar zum Neuen Testament* (Freiburg, 1893); G. Wohlenberg, in *Strack and Zückler, Kommentar* (Munich, 1895); E. Haupt, in *Meyer, Kommentar* (Göttingen, 1897); T. K. Abbott, in *International Critical Commentary* (New York, 1897). *Introductions:* H. J. Holtzmann (Freiburg, 1892); F. Godet, Eng. trans. (Edinburgh, 1894); G. Salmon (London, 1894); A. Jülicher (Leipzig, 1901); B. Weiss, Eng. trans. (Edinburgh, 1888); Th. Zahn (Leipzig, 1900); J. Moffatt, *The Historical New Testament* (New York and Edinburgh, 1901). *Discussions:* E. T. Mayerhoff, *Der Brief an die Kolosser* (Berlin, 1838); F. C. Baur, *Paulus* (Eng. trans., London, 1873-75); H. J. Holtzmann, *Kritik der Epheser und Kolosserbriefe* (Leipzig, 1872); F. A. Henle, *Kolossä und der Brief des Apostels Paulus an die Kolosser* (Munich, 1887).

COLOSSOCHELYS, kô-lôs'sô-kê'lis (Neo-Lat., from Gk. κολοσσός, *kolossos*, colossus + χέλυς, *chelys*, tortoise). A gigantic fossil turtle found in the Pliocene deposits of India. See **TURTLE**.

COLOSSUS (Lat., from Gk. Κολοσσός, *Kolosos*). A rare Greek word of unknown origin, used to denote a statue very greatly above the size of life. In English, the adjective colossal is used in a somewhat wider sense, to denote all statues which exceed the size of life. The colossal was the peculiar characteristic of Egyptian art, and innumerable colossi were raised in Egypt, mostly of the hardest stone, many of them 50 to 60 feet in height. Among the most celebrated are the two statues of Amenophis III., near Thebes, one of which was called by the Greeks 'Memnon,' and famed for its supposed vocal qualities. But it was in the artistic world of Greece that the most famous colossi appeared: e.g., the bronze statue of Pallas Athene, on the acropolis of Athens, the plume of whose helmet and the point of whose spear were landmarks to sailors between Sunium and Athens; another

statue of the same goddess, of gold and ivory, in the Parthenon at Athens; and the Olympian Zeus, of the same material, the masterpiece of Phidias, who was also the author of the two statues just mentioned. Among the seven wonders of the old world was reckoned the gigantic Colossus of Rhodes, representing Helios, the sun-god, the national deity of the Rhodians. It is said to have been the work of Chares, of Lindus, a famous pupil of Lysippus. It was erected by the Rhodians, at a cost of 300 talents, apparently as a thank-offering after the successful defense of the city against Demetrius. It is said to have been of bronze, cast in separate pieces, and to have occupied the artist twelve years. It was set up about B.C. 280, but fifty-six years later was overthrown by an earthquake, and lay in ruins, until in A.D. 653 the Arabs captured the city and sold the metal to a Jewish merchant. The height is variously stated, but was probably about 90 feet. The Hellenistic age seems to have taken delight in colossal statues and groups, and the Romans followed the Greeks. We hear of a statue of Jupiter on the Capitol made from the spoils of the Samnites, of such a size as to be visible from the Alban Hills. More celebrated was a Colossus of Nero, executed in marble, of the enormous height of 110 or 120 feet, from which the neighboring amphitheatre is believed to have derived the name of 'Colosseum.' At the death of Nero the head was changed to that of the sun-god. It was subsequently moved by Hadrian to make room for his temple of Venus, and finally disappeared during the Middle Ages. Its later pedestal was discovered in 1828, and may be seen between the Colosseum and the temple built by Hadrian. In modern times many colossal statues have been set up. Especially celebrated are the "Bavaria," at Munich, the "Germania," at the Niederwald on the Rhine, the equestrian statue of Peter the Great in Saint Petersburg, and the Bartholdi statue of "Liberty Enlightening the World," in New York Harbor.

COLOS'TRUM (Lat.). A term applied to the first milk yielded after the birth of the young. It differs materially from ordinary milk in appearance and composition, and is ordinarily considered unfit for consumption or manufacture. When examined under the microscope it is found to contain, in addition to the ordinary fat globules of milk, peculiar aggregations of very minute fat granules, which are known as colostrum corpuscles, and which are probably the debris of the cells of the mammary gland. The chief chemical differences between colostrum and milk are a larger percentage of total solids (20-30), a much greater proportion of albumin and ash, and much less milk-sugar. The fat differs somewhat in character from that of normal milk, containing considerable cholesterol. Colostrum exerts a purgative effect upon the newborn infant, and thus removes the meconium which has accumulated in the fetal intestine. Colostrum disappears as such within a few days after parturition, gradually assuming the characteristics of normal milk.

COLPEO. A fox-dog (*Canis Magellanicus*) of Patagonia and Tierra del Fuego, larger, redder, and more wolf-like than the other South American species. See **FOX-DOG**.

COLPORTAGE (from Fr. *colporteur*, to carry on one's neck, from *col*, Lat. *collum*, neck + *porter*, Lat. *portare*, to carry). The distribution of religious publications, books, tracts, and periodicals, by carriers called *colporteurs*.

COLQUHOUN, kó-hóon'. ARCHIBALD ROSS (1846—). An English traveler, born at sea off the Cape of Good Hope. He became associated with the Indian Department of Public Works in 1871. After acting as secretary of the British Commission to Siam, he in 1881-82 and 1883-84 made extensive tours of exploration in order to find a convenient route for a railway between India and China. He became administrator of Mashonaland in 1890, and subsequently visited Central America as a representative of the Panama and Nicaragua canal projects. His publications include *Across Chrusé* (2 vols. 1883); *The Opening of China* (1884); *English Policy in the Far East* (1885); *The Key of the Pacific* (1895); *China in Transformation* (1898); *Overland to China* (1901); he was also joint author of a *Report* on railway communication between India and China (1885) to the establishment of which he has devoted his best energies.

COLQUHOUN, Joux (1805-85). A Scottish writer on sport. He was born at Edinburgh, and was educated at the university in that city. In 1840 he recorded his manifold adventures as a sportsman in the extremely interesting and popular volume entitled *The Moor and the Loch*, which has passed through six editions.

COLQUHOUN, PATRICK (1745-1820). An English police magistrate and writer, distinguished for his efforts in behalf of administrative reform and the amelioration of the condition of the poor. He was born at Dumbarton, and at an early age went to Virginia, where he became a successful merchant. Returning to Glasgow in 1766, he became prominent in public affairs, and in 1782 founded the Glasgow Chamber of Commerce, the oldest institution of its kind in Great Britain. He removed to London in 1789, and published there in 1795 his famous *Treatise on the Police of the Metropolis*, in which he advocated a complete reform of the police system of that city. Several of the recommendations made by him in the work, which passed through seven editions, were subsequently adopted. In consequence of the numerous important municipal reforms introduced by him, he was appointed magistrate at Westminster, London, in 1798.

COLQUHOUN, Sir PATRICK, or MAC CHOMBAICH DE (1815-91). An English lawyer. He was a great-grandson of Patrick Colquhoun (q.v.) and was educated at Westminster, Cambridge, and Heidelberg. He was for many years a member of the diplomatic service, more particularly in Saxony, where he was counselor of legation until 1866. He also held the position of Chief Justice of the Supreme Court of the Ionian Islands while these were under British rule (1861-64). His principal work is the *Summary of the Roman Civil Law* (1849-60).

COLQUITT, ALFRED HOLT (1824-94). An American soldier and politician, the son of Walter T. Colquitt (q.v.). He was born in Walton County, Ga., graduated at Princeton in 1844, and was admitted to the bar in the following year. He volunteered for service in the United States Army at the beginning of the Mexican War; was

soon afterwards appointed major, and served as an aide to General Taylor at the battle of Buena Vista. From 1853 to 1855 he was a prominent Democratic member of Congress, but at the expiration of his term declined a renomination. On the approach of the Civil War he became an active secessionist, and was a prominent member of the Georgia secession convention. He enlisted in the Confederate Army early in 1861; quickly rose from the rank of captain to that of major-general; was engaged in most of the operations in Virginia; distinguished himself at Antietam and Petersburg, and was in command at the battle of Olustee, Fla. After the war he was Governor of Georgia from 1876 to 1882, and was a member of the United States Senate from 1882 until his death.

COLQUITT, WALTER T. (1799-1855). An American lawyer and politician, born in Halifax County, Va. He studied at Princeton, read law at Milledgeville, Ga., was called to the bar in 1820, and practiced with eminent success, first at Sparta and later at Cowpens. In 1834 and 1837 he was a member of the State Senate of Georgia, and from 1839 until his resignation in 1840 occupied a seat in the Federal House of Representatives. In 1842-43 he was again in Congress, and from 1843 until his resignation in 1848 was a United States Senator. He was originally a States-rights Whig, but became a Van Buren Democrat. During the Mexican War he was strongly opposed to the Wilmot Proviso (q.v.).

COLT, kólt, SAMUEL (1814-62). An American manufacturer, inventor of the revolver. He was born in Hartford, Conn., where he worked in his father's factory. Obtaining a knowledge of chemistry, he lectured on that subject in the United States and Canada, and in 1835 secured patents for a revolving pistol, a wooden model of which he had made while at sea when a boy. In the same year the Patent Arms Company was formed for the manufacture of his invention, but became insolvent in 1842 through insufficient demand for its product. In 1847 Colt contracted to make 1000 weapons for General Taylor, and the improvement of the revolver, together with the increased demand for it, set the business on a stable footing, while new improvements were constantly made in the weapon. In 1852 he built a large armory in Hartford, where, besides firearms, machinery is made for their manufacture in other places, notably at the English and the Russian arsenals. He invented a battery for submarine harbor defense, and in 1843 laid and successfully tested in New York Harbor the first submarine telegraph cable. His line was insulated with a combination of cotton yarn, beeswax, and asphaltum, incased in a lead pipe, gutta-percha not then having been discovered.

COLTON, kólt'on, WALTER (1797-1851). An American writer. He was born in Rutland, Vt., graduated at Yale and Andover, and for several years was professor of moral philosophy and belles-lettres in the Middletown (Connecticut) Academy. In 1831 he became chaplain in the navy. He was made alcalde of Monterey, Cal., in 1845, and founded the *Californian*, the first newspaper published in that State. He also built the first school-house and made the first announcement of the discovery of gold. Colton edited newspapers in Washington, Charlestown, Mass., and Philadelphia, and published *Ship and*

Shore in Madeira, Lisbon, and the Mediterranean (1835); *A Visit to Athens and Constantinople* (1836); *Three Years in California* (1850); and *Deck and Port* (1850), besides other lively stories of travel and the sea.

COLTSFOOT. See TUSSILAGO.

COLU'BRIDÆ (Neo-Lat. nom. pl., from Lat. *coluber*, serpent). The largest and most scattered family or group of snakes. It is variously limited by systematic authors, and has served as a residuary group for all serpents not easily classified elsewhere, so that a definition is difficult. The group, however, may be said to include the 'common' small, harmless serpents everywhere. The garter-snakes, water-snakes, hog-nose, etc., are North American representatives of this family, to which, indeed, all non-venomous American snakes belong except a few species along the Mexican border.

COLUGO, kó-lóo'gò, or KAGUAN. See COBEGO.

COLUM'BA, SAINT, SAINT COLUM-CILLE, or SAINT COLM (521-597). An Irish missionary, one of the greatest names in the early ecclesiastical history of the British Isles. He was born at Gartán, County Donegal, northwest Ireland, December 7, 521. His father was Fedhilmidh, of the powerful Clan O'Donnell, and related to several of the rulers of Ireland and West Scotland; his mother was Eithne, who also boasted royal ancestry. He studied first at Moville, County Down, five miles south of Bangor, on Belfast Lough, under Bishop Saint Finnian, and was ordained deacon by him; next under another Saint Finnian, at Clonard, who ordained him a priest. He was early distinguished by his piety, and the name Columba, i.e. dove, was recognized as an appropriate one. He showed rare monastic zeal. In 545 he founded the church and monastery of Derry, and in 553 those of Durrow, not far west of Dublin. The latter became of great importance, and in both places the saint is still commemorated by a well and a stone. He founded other monasteries, the chief of which was Kells. In 561 he embroiled himself in the civil strifes of his country and was charged with having incited the bloody battle of Culdreimhne (now Cooladrummon), because he appealed to his tribe to defend by force of arms the copy of the Latin Psalter which he had made from one borrowed of his old teacher, Saint Finnian of Moville. But for being thus the occasion of bloodshed he was censured by 'an Irish ecclesiastical synod, and recommended to do penance by foreign missionary labor. Accordingly, in 563, he headed a little company of twelve disciples and sailed across to the west coast of Scotland, and landed upon the little island of Hy, since called I-colum-eille, but better known as Iona. It lies just opposite Oban. There he began the great work of converting the Picts, to which he owes his fame. His missionary operations were probably very simple, consisting of persistent personal appeals. In the legends which are told about him, as in the life of him by Adamnan and in the *Book of Deer*, a Celtic MS. of the eleventh or twelfth century, preserved at Cambridge, England, edited by John Stuart for the Spalding Club (Aberdeen, 1869), the miraculous cures. Many miraculous occurrences are narrated of him, whose traditions still linger in the scenes of his labors. He promoted monasticism, overcame the opposition of the Druids, made

many converts, including royal personages, and founded many churches. As in Ireland, so in Scotland, he took part in secular affairs, and at least one battle is said to have been incited by him. He died at Iona at midnight between June 8 and 9, 597, and left an imperishable name. With loving care his bones were enshrined, and his relics—the stone pillow on which he slept, the books he loved so well, the staff which was the symbol of his pastoral authority, and other objects which he had used—were long preserved and exhibited. Columba was a poet, and three Latin hymns now extant are attributed to him. In one of them, the "Altus Prosator," published with an English paraphrase, by John, Marquis of Bute (Edinburgh, 1872), each strophe begins with a different letter, in alphabetical order. Besides these, some Celtic poems are attributed to him, and a Rule (printed in Celtic and English in Haddon and Stubbs, *Councils and Ecclesiastical Documents*, ii. 119, and in English only in Skene, *Celtic Scotland*, ii. 508).

Columba was an ascetic, capable of any amount of deprivation. He was an eager student and made copies with his own hand of documents which fell in his way. Two of these—the *Book of Kells* and the *Book of Durrow*—were long preserved. His energy sometimes led him to harsh actions, but that he was tender-hearted the affection of his monks evinces. He seems to have had original ideas upon Church government; for Bede writes of Iona that its ruler was "an abbot, who is a priest, to whose direction all the province, and even the bishops, contrary to the usual method, are subject, according to the example of their first teacher [Columba], who was not a bishop, but a priest and a monk" (*Eccles. Hist.*, iii. 4). Bede then criticises the Columban monks because they did not, until 715, keep Easter after the Western manner, but upon the 14th of Nisan, or whatever day it came, as the Eastern Church did. Other peculiarities of the Columban monks, presuming that they followed the Irish models, was that they lived in huts grouped around a church and surrounded by a wall; each hut had its head, but all were under the abbot, who performed episcopal functions though not usually a bishop, and was a spiritual father to all the community, and when he pleased summoned all the members to him by ringing a hand-bell, one of the insignia of his office. The monks dressed in an undergarment covered by a coarse woollen wrapper fastened around the waist by a rope. They shaved the front part of their heads from a line drawn over the top from ear to ear. Their religious services were numerous and strictly attended to, but the rest of their time was spent in labor, either in working upon their fields and tending cattle (for they raised what they needed for their support), or in copying books, particularly the Bible, or in studying or in teaching others. Latin was spoken as well as Celtic, and was employed by them in writing. Some of the monastic communities contained famous schools, where Greek and even Hebrew were taught. The continuance of the memory of Saint Columba in Scotland is shown by the fact that his is one of the commonest names given to a church, even to-day, among the Presbyterians. The life of Saint Columba was written by two of his successors in the abbacy of Iona—Cuimíne Ailbhe, seventh abbot (657-69), whose *De Virtutibus*

Sancti Columbae (printed by Pinkerton, London, 1789; Paisley, 1889) was incorporated in the *Vita Sancti Columbae* of Adamnan, the ninth abbot (679-704). But both these writers are concerned not so much with the life as with the prophecies, miracles, and other unusual phenomena which were ascribed to their subject, and so the amount of real biographical facts is very small. This 'life' by Saint Adamnan is, however, one of the best of the mediæval lives of saints. It has been edited in a very superior manner, first by W. Reeves (Dublin, 1857), and again upon Reeves's edition by J. T. Fowler (Latin text and English notes, Oxford, 1894; English translation of the text, 1895).

COLUM'BÆ (Lat. nom. pl. of *columba*, dove). An order of birds, containing the pigeons (Columbidae and allied families) and the dodos (Didiidae). See DODO; DOVE; PIGEON.

COLUM'BAN, or **COLUMBA'NUS**. SAINT (543-615). One of the most learned and eloquent of the many missionaries whom Ireland sent to the Continent during the Dark Ages. He was born in Leinster. Having studied under Saint Congall, in the great monastery of Bangor, in Ulster, he passed over to France, accompanied by twelve companions, and in Austrasia and Burgundy, near the southern extremity of the Vosges Mountains, founded the monasteries of Anegray, Luxeuil, and Fontaine. His adherence to the Irish rule for calculating Easter involved him in controversy with the French bishops about 605; and a few years later the courage with which he rebuked the vices of the Burgundian Court led to his expulsion from France. Passing through Switzerland into Lombardy, he founded, in 612, the famous Monastery of Bobbio, in the Apennines, where he died on November 21, 615. The writings of Saint Columban, which are wholly in Latin, consist of a rule for the government of his monastery, a few poems, several letters on ecclesiastical affairs, and sixteen short sermons. His monastic rule has been printed more than once; but the most complete edition of his works is in Patrick Fleming's *Collectanea Sacra*, published at Augsburg in 1621, and at Louvain in 1667. It is reprinted in Migne, *Patrol. Latina*, lxxx. Of the sermons of Saint Columban, M. Guizot remarks that "the flights of imagination, the pious transports, the rigorous application of principles, the warfare declared against all vain or hypocritical compromise, give to the words of the preacher that passionate authority which may not always and surely reform the soul of his hearers, but which dominates over them, and, for some time at least, exercises paramount sway over their conduct and their life." The town of San Colombano, in Lombardy, takes its name from the Irish monk, as the town and Canton of Saint Gall (q.v.), in Switzerland, perpetuate the name of the most favored of his disciples. For his life, consult: Jonas, who was almost a contemporary and one of his successors as the Abbot of Bobbio, in Migne, *Patrologia Cursus Completus* (Paris, 1857-60); also W. F. Besser, (Leipzig, 1857); and J. K. Zimmermann (Saint Gall, 1865).

COLUMBARIUM (Lat., dove-cote, from *columba*, dove). From a fancied resemblance to a dove-cote, the name given to the niches in Roman burial-places arranged in rows around the walls of the sepulchral chambers to receive the little

urns or sarcophagi of marble or terra-cotta containing the ashes of the deceased: finally, to the sepulchral chamber itself. Tombs of this description were chiefly used by the poorer classes who could not afford separate tombs, and were erected by great families for their slaves and dependents, or by funeral associations or corporations under the Empire. Several perfect examples have been found near Rome; among them, those of the Vigna Codini, at the Licinian Gardens. Others exist at Naples and elsewhere in Italy. The *ustrina*, or places for incinerating the bodies, were attached to the columbaria. In recent times the term columbarium is applied to a room or hall connected with a crematory, and provided with niches for the cinerary urns.

COLUM'BA'S ISLE. The poetic name for the island of Iona, on the western coast of Scotland, where Saint Columba, 'The Apostle of Caledonia,' founded a monastery about 565, and was buried in 597.

COLUM'BIA (Neo-Lat., from *Columbus*). The name under which the United States is usually personified.

COLUMBIA. A name formerly applied to the region, west of the Rocky Mountains, embracing British Columbia and the States of Washington and Oregon.

COLUMBIA. A city and county-seat of Boone County, Mo., 144 miles west-northwest of Saint Louis; on the Wabash Railroad, and connected by a branch with the Missouri, Kansas and Texas system (Map: Missouri, D 3). It has flouring and planing mills, elevators, and manufactures of agricultural implements; also farming, fruit-growing, and stock-raising interests. The city is the seat of the State University, organized in 1842; State Agricultural College; and of institutions for women, Christian College (Christian), established in 1851, and Stephens College (Baptist), founded in 1856. The monument to Thomas Jefferson originally erected in Monticello, Va., is located here, also a State hospital and a United States Government experiment station. Settled in 1820, Columbia is governed by a mayor, elected biennially, and a city council. Population, in 1890, 4000; in 1900, 5651.

COLUMBIA. A borough in Lancaster County, Pa., 28 miles southeast of Harrisburg; on the Susquehanna River, here more than a mile wide, and on the Pennsylvania and the Philadelphia and Reading railroads (Map: Pennsylvania, E 3). It is an important industrial centre, its manufactures including boilers and engines, iron, laundry machinery, silk, lace, shirts, wagons, brushes, flour, novelties, malt liquors, stoves, etc. Wrightville, on the west bank of the river, is connected with the borough by one of the longest bridges in the United States. The place was founded in 1726 by English Quakers from Chester County, and was for many years called Wright's Ferry. In 1789 it was proposed to locate the capital of the United States here. In June, 1863, the original bridge was burned to prevent the Confederate troops from marching on Philadelphia. Population, in 1890, 10,199; in 1900, 12,316.

COLUMBIA. The capital of South Carolina, and county-seat of Richland County, on the east bank of the Congaree River below the junction

of the Broad and Saluda rivers, 84 miles north-east of Augusta, Ga., and 137 miles northwest of Charleston; on the Southern, the Atlantic Coast Line, and the Seaboard Air Line railroads (Map: South Carolina, D 2). It is at the head of steam navigation on the river, and is on the Columbia Canal, which furnishes abundant water-power (13,000 horse-power). The city is handsomely laid out with streets well shaded and crossing at right angles, and has a fine park. Among the prominent buildings are the Capitol, court-house, city hall, the State insane asylum, and the State penitentiary. The city maintains a municipal hospital and a public library. The educational institutions include the South Carolina College, opened in 1805; Presbyterian Theological Seminary; Columbia Female College (Methodist Episcopal, South), opened in 1859; Presbyterian College for Women, opened in 1890; Allen University (African Methodist Episcopal), opened in 1881; and Benedict College (Baptist) for colored students. Columbia is the seat of a very considerable manufacturing industry, principally in cotton; and there are also sash and door factories, iron-works, foundries, and machine-shops, etc. The government of the city, under a charter of 1854, revised in 1894, is administered by a mayor, who holds office for two years, and a city council elected by wards. The executive appoints one trustee in public schools; and the city clerk, auditor, engineer, police commissioners, and clerk of market are all selected by the council. The water-works are owned and operated by the municipality. Population, in 1890, 15,353; in 1900, 21,108.

In response to a demand for a more central place of government than Charleston, the Legislature in 1786 ordered Columbia, which had been settled about 1700, to be laid out, and in January, 1790, it met there for the first time. On February 17, 1865, General Sherman, at the head of the Union army, entered Columbia, and that night a fire broke out, raging for a day, which destroyed three-fifths of the city, including the old State House and its library of 25,000 volumes, a convent, several churches, the railroad depot, and much cotton. After the war, however, Columbia rapidly recovered its prosperity.

COLUMBIA. A city and county-seat of Maury County, Tenn., 45 miles south of Nashville, on Duck River, and on the Louisville and Nashville, the Nashville, Chattanooga and Saint Louis, and other railroads (Map: Tennessee, D 5). It is the centre of a fertile agricultural region, and an important grain and live-stock market. It controls large phosphate interests, and has cotton and flouring mills, pump-factory, etc. A United States arsenal is located here. Settled in 1811, Columbia was first incorporated in 1822. It is governed under a revised charter of 1893, which provides for a mayor, elected every two years, and a council elected on a general ticket. Population, in 1890, 5370; in 1900, 6052.

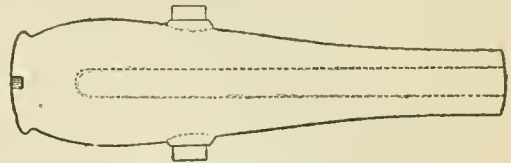
COLUMBIA, BRITISH. See BRITISH COLUMBIA.

COLUMBIA, DISTRICT OF. See DISTRICT OF COLUMBIA.

COLUMBIA CITY. The county-seat of Whitley County, Ind., about 100 miles north by east of Indianapolis; on the Wabash and the

Pittsburg, Fort Wayne and Chicago railroads (Map: Indiana, D 1). Population, in 1890, 3027; in 1900, 2975.

COLUMBIAD. A heavy gun invented by Colonel Bomford and combining some of the features of the gun, howitzer, and mortar, answering in this respect to the modern breech-loading



COLUMBIAD.

rifled mortar or howitzer. It appeared early in the nineteenth century and was in use until after the War of the Rebellion. See ARTILLERY; also BALLISTICS; GUNS, NAVAL; and ORDNANCE.

COLUMBIAD, THE. A lengthy poem, by Joel Barlow (1807), enlarged from his previous *Vision of Columbus* (1787), and incorporating also some of his other poems.

COLUMBIAN EXPOSITION. See WORLD'S COLUMBIAN EXPOSITION.

COLUMBIA or **OREGON RIVER.** One of the largest rivers of North America, rising in the eastern chain of the Rocky Mountains in British Columbia, in about latitude 50° N. and longitude 116° W. (Map: Washington, E 4). It flows at first northwest as far as latitude 53°, and then turns sharply on itself and flows south into Washington. Just before crossing the boundary, it is joined by the Pend Oreille River (Clarke's River or Fork), a large branch from the east. In Washington it flows in a winding course, at first south (to its junction with Spokane River), then west, then south, and then southeast to the Oregon line in about longitude 119° W. Near the Oregon boundary it is joined by its largest branch, Snake River, which rises in Yellowstone Park. Below the point of junction the river flows in a westerly direction, forming the boundary between Oregon and Washington over the remaining distance to the Pacific, being joined on its way by the John Day, Deschutes, and Willamette rivers from the south. Its head-waters drain the Rocky Mountain region on the west from about latitude 54° N. to about latitude 42° N. Its length is 1300 to 1400 miles. Its drainage area is fully 300,000 square miles, and its low-water flow at the Dalles, Oregon, is 108,000 cubic feet per second. The river is broken by falls and rapids into many separate portions; the first navigable reach is that from its mouth to the Dalles, 190 miles in length. From Celilo, 13 miles above the Dalles, it is navigable to Priest Rapids, 198 miles, and for several shorter stretches farther up, the total navigable length amounting to 756 miles. The total navigable mileage of the Columbia and its branches is 2132 miles. The important city of Vancouver, Wash., is built on its northern bank, just above the entrance of the Willamette, and Astoria, Oregon, is situated at the mouth of the river. The value of the river as a waterway is lessened by the fact that the entrance to its mouth is obstructed by a bar. Large vessels, however,

ascend the Columbia to Vancouver, and also the Willamette to Portland. The tide ascends to the cascades about 150 miles from the sea, which are overcome by vessels through a lock constructed by the United States Government. (See JETTY.) The Columbia is famous for its salmon fisheries. This great river was long vaguely believed to exist. Its mouth was discovered only in 1792, by Captain Gray, of Boston, Mass., who gave it the name of his own vessel in place of the name Oregon. It was explored by Lewis and Clark in 1804-05.

COLUMBIA SALMON. See QUINXAT. •

COLUMBIA UNIVERSITY. One of the oldest educational institutions in the United States, situated in New York City. The first step toward its foundation was the authorization in 1746 by the Colonial Assembly of public lotteries for the establishment of a college in the Province of New York. The proceeds, amounting in 1751 to £3443 18s., were vested in a board of ten trustees, of whom seven were members of the Church of England. The preponderating English influence thus represented, and the application of the trustees for a royal charter, excited much opposition in New York, where it was thought that the college should be entirely an American institution. Nevertheless, a charter for 'King's College' was obtained from George II. in 1754, and the management of this college was vested in a corporation composed of the Archbishop of Canterbury, the Governor of the Province, and other Crown officers *ex officio*, the rector of Trinity Church, the ministers of the Dutch Reformed churches, and twenty-four gentlemen of New York. In the following year Trinity Church conveyed a considerable plot of land to the college on condition that its presidents should always be members of the Church of England, and that the Church Liturgy should be read in the college mornings and evenings. Dr. Samuel Johnson, of Connecticut, was installed as the first president; and in 1756 the erection of a college building was begun near what is now West Broadway and Murray Street. In 1764 Dr. Johnson was succeeded by the Rev. Myles Cooper. Under President Cooper the college prospered, and a medical department was founded in 1767; but President Cooper was a Royalist, and, becoming involved in 1774 in a political controversy with Alexander Hamilton, then still an undergraduate, was presently mobbed at his house, and soon after sailed for England. In 1776 the college buildings were seized by the Committee of Safety for hospital purposes, and the college exercises were practically suspended until 1784, when the institution reopened as Columbia College, under a State charter, vesting its control largely in political officers. This, however, proved unsatisfactory; and in 1787 a new charter was granted similar to the original one except as to the denominational clause, and the management of the institution was vested in a self-perpetuating board of twenty-four trustees. About this time the income of the college was £1330, while its faculty numbered six, three giving instruction in medicine and three in the arts. New life was given to the institution in 1792 by a grant from the State of £7900 outright and of £750 for seven years. The faculty was enlarged, and Mr. James Kent, afterwards the famous Chancellor Kent, was elected to a

professorship of law. But the State refused further funds in 1799, and the college suffered seriously in consequence. In 1813 the medical school was incorporated with the College of Physicians and Surgeons.

In 1814 the Legislature granted the college a strip of land known as the Hosack Botanical Garden, extending from Forty-seventh to Fifty-first Street, and from Fifth Avenue to nearly Sixth Avenue, as a reimbursement for lands in New Hampshire belonging to the college which were ceded by the State on the settlement of the New Hampshire grants. For many years this property yielded no income; but at present it is an important source of revenue. In 1823 Professor Kent was reappointed to the chair of law and delivered his famous lectures, which were, in 1826, published as *Kent's Commentaries*. In 1830 the contemplated establishment of a rival institution in the city of New York spurred on the board of trustees to new activity. The full course was enlarged, and scientific and literary courses were instituted, designed for special students. In this Columbia would seem to have anticipated its future development as a university. But the time for such a project was not ripe, and the special courses were discontinued in 1843, though their major subjects were continued in its full course. In 1857, owing to the rapid growth of the city, the college was removed to the site bounded by Forty-ninth and Fiftieth Streets and Madison and Fourth Avenues, and a postgraduate course, combining all the features of a university, was projected as part of a general plan of expansion. In 1858 a law school was established. Beginning with 35 students, it had an attendance of 171 in 1864. In 1860 a nominal union was effected with the College of Physicians and Surgeons. To meet the increasing need of mining and other engineers, Columbia College established, in 1864, the School of Mines and Metallurgy.

Dr. Frederick A. P. Barnard succeeded President King in 1864 and a new era of progress began. Dr. Barnard was a friend of classical learning, but he held that a system of education not supported by popular sanction can never be made an efficient instrument of culture; and when the attendance at the college fell to 116 in 1872, the fact was attributed by him to the rigidity of the college curriculum. In 1880 the School of Political Science was established, and in 1881 a department of architecture was instituted in the School of Mines. In 1883 a course of study under the general supervision of the college faculty was designed for women, and in 1887 women were authorized to receive the degree of B.A., but this practice was discontinued on the establishment of Barnard College (q.v.) for women in 1889. When President Barnard entered upon his duties as president, Columbia College consisted of the college, an inchoate School of Mines, the Law School, and a nominally associated Medical School. Twenty-five years later, at the close of President Barnard's administration, Columbia College comprised the college, the School of Law, the School of Political Science, and the School of Mines and Metallurgy, including the Schools of Civil and Sanitary Engineering, Applied Chemistry, and Architecture. The university had increased greatly in size, and the elective system had been largely introduced.

Upon President Barnard's death, in 1889, the

Hon. Seth Low was elected as his successor. He found several flourishing but loosely connected schools, whose work he correlated, reorganized, and consolidated. In 1891 the College of Physicians and Surgeons surrendered its charter and became an integral part of Columbia College. In 1890 the School of Philosophy was established, taking charge of the advanced work in philosophy, psychology, education, ancient and modern languages and literature. In 1892 departments of mathematics, mechanics, physics, mineralogy, chemistry, etc., combined to form the School of Pure Science. The several schools of engineering were in 1896 organized into the School of Applied Sciences. In the same year the name 'Columbia University' was adopted to designate the institution as a whole, and the name 'Columbia College' was restricted to the undergraduate department. In 1898 Teachers College (q.v.) became affiliated with Columbia, and in 1900 Barnard College became a part of the university. On President Low's resignation in 1901, Professor Nicholas Murray Butler was elected to succeed him.

Columbia University at present comprises the following schools and colleges: (1) Columbia College. The college confers the degree of B.A. and offers a wide range of subjects, mostly elective. Its students register under any of the university faculties in their fourth year, thus practically shortening the college course, in the case of students who take up professional courses, to three years. In 1902, the date for all the statistics of attendance quoted, the number of students in the college was 492. The college offers 72 scholarships of the value of \$150, and a number of prizes. (2) Barnard College. This is an undergraduate school for women, and its management is vested in a separate board of trustees. It offers courses leading to the B.A. degree. Graduates of Barnard College are admitted to the university as candidates for the M.A. and Ph.D. degrees; but the professional schools of Columbia University, except Teachers College, are as yet not open to women. Barnard College has an attendance of 339. (3) The School of Law, which offers courses covering a period of three years and leading to the degree of LL.B. On certain specified conditions its students may also earn the LL.M. and A.M. degrees. Twenty scholarships are available for students; its attendance is 400. (4) The College of Physicians and Surgeons. With this are connected Vanderbilt Clinic, one of the finest hospitals in the world, and the Sloane Maternity Hospital. It confers the M.D. degree, and under special conditions its students also may earn the M.A. degree. It has an attendance of 809 students. (5) The Schools of Political Science, Philosophy, and Pure Science. These have charge of the graduate courses in the departments of mathematics, natural sciences, public law, history, literature, philology, philosophy, psychology, anthropology, and education. Their courses lead to the A.M. and Ph.D. degrees. The student registration is 508. (6) The School of Applied Science, which is composed of the schools of Chemistry, Mines and Engineering, and offers courses covering periods of four years, leading to the degrees of E.M., Met.E., B.S., C.E., E.E., and Mech.E., also graduate courses leading to the A.M. and Ph.D. The total attendance is 626. (7) The courses in fine arts, comprising the course in architecture,

leading to the degree of B.S., and the courses in music, were placed in 1902 under the administrative control of the president of the university. (8) Teachers College, one of the leading schools for the training of teachers in the world, offers courses leading to the B.S. degree and to the several Teachers College diplomas. It is open to men and women on equal terms. It constitutes a separate corporation. It has an attendance of 634 students. (9) The Summer School of the university, designed especially for teachers, was organized in 1900 and has become a permanent feature. The attendance in 1902 was 643.

The government of the university is divided between a board of 24 trustees, of which the President is a member, having charge of the financial affairs of the institution; the University Council, composed of the President, the Dean, and a delegate from each school or college, to whose care are confided the educational interests of the university, subject to the reserved power of control of the trustees and the several faculties in charge of the respective schools. The total valuation of the university property and endowments is about \$20,000,000. The receipts of the university in 1901 were \$836,108.56, and the expenses \$844,329.85. The library numbers about 315,000 volumes, including the Avery Architectural Library and the famous Phoenix collection, but exclusive of unbound pamphlets. A number of societies make it the depository of their rare collections of books. In 1897 Columbia University removed to its new buildings on Morningside Heights. The principal buildings, grouped around the library, the gift of ex-President Low, are the Havemeyer, Fayerweather, and Schermerhorn Halls, and the Engineering Building and Earl Hall. The gymnasium is part of the building of the Alumni Memorial Hall. Barnard College and Teachers College occupy buildings of their own outside of the campus. Earl Hall represents the religious interests of the university.

Columbia University is intimately connected with many of the educational institutions of New York. Lectures are delivered by Columbia professors at the American Museum of Natural History, the Metropolitan Museum of Art, and at Cooper Union. Students of botany are permitted to pursue lines of research at the New York Botanical Garden, where courses in special investigation are conducted by Columbia University professors. The university offers free tuition to students in the several theological seminaries in New York and its vicinity, and these institutions reciprocate the privilege. The university also offers 26 fellowships, ranging from \$500 to \$1300 a year, and 34 graduate scholarships of the value of \$150 each. The total number of students attending the university is 3632. Under the auspices of the Columbia University Press, established in 1893, are published a large number of works, monographs, and serial studies, written by professors and post-graduate students, and exhibiting the results of original research in various of the university departments. There are also published the *Political Science Quarterly*, and the *Columbia University Quarterly*, formerly the *Columbia Bulletin*. The presidents of the university have been: Samuel Johnson, D.D. (1754-63); Myles Cooper, S.T.D., LL.D. (1763-76); William S. Johnson, LL.D. (1787-1800); Charles H. Wharton, S.T.D.

(1801-11); William Harris, S.T.D. (1811-29); William A. Duer, LL.D. (1829-42); Nathaniel F. Moore, LL.D. (1842-49); Charles King, LL.D. (1849-64); Frederick A. P. Barnard, S.T.D., LL.D. (1864-89); Seth Low, LL.D. (1890-1902); Nicholas Murray Butler, Ph.D., LL.D. (1902-).

Consult: George H. Moore, *The Origin and Early History of Columbia College* (New York, 1890); John B. Pine, *Charter, Acts, and Official Documents of Columbia College* (New York, 1895); Brander Matthews, *American Universities* (New York, 1895); N. F. Moore, *An Historical Sketch of Columbia College*; J. Howard Van Amringe, *Universities and their Sons* (Boston, 1898); *Circular of Information No. 3, 1900, Bureau of Education* (Washington, D. C., 1900).

COLUMBIAN UNIVERSITY. An institution of higher education, situated at Washington, D. C. The university was founded in 1821 by members of the Baptist Church and until 1873 was known as Columbian College. At its inception the university comprised a theological, a classical, and a medical department. A law school, which was organized in 1826, was discontinued in 1827 and was not reopened until 1865. Differences that had arisen among the trustees caused, in 1827, the abandonment of the theological department. In the same year the financial troubles of the institution reached such an acute stage that all the departments were suspended. The college, however, reopened in 1828, and since then has maintained a steady growth. In 1843 it was freed from indebtedness, but it had still no permanent endowment. At the outbreak of the Civil War the greater part of the students left and the buildings were partially converted into Government hospitals. In 1884 a scientific school was established, named the 'Corcoran Scientific School,' in honor of Mr. W. W. Corcoran, one of the university's greatest benefactors; in 1887 a dental school was organized in connection with the university. At present Columbian University comprises the following schools: (1) Columbian College, offering courses partially elective, leading to the degrees of B.A. and B.S.; (2) the Corcoran Scientific School, conferring the B.S. degree; (3) the School of Graduate Studies, which confers the degrees of M.A., M.S., Ph.D., E.E., C.E., and Mech.E.; (4) the Law School, which confers the LL.B. and M.P.L. degrees; (5) the School of Jurisprudence and Diplomacy, which confers the degrees of M.Dip., D.C.L., and LL.M.; and (6) the Medical and Dental Schools, conferring the degrees of M.D. and D.D.S., respectively. The university has a registration of 1420 students and a faculty of 180. Owing to the vast educational resources which the capital affords, including the National Library, the archives, and many special collections, the university is enabled to carry on its work on an endowment of \$200,000. The property value of the university is about \$1,000,000 and the library, which is mainly departmental, numbers about 20,000 volumes.

COL'UMBINE (Fr., It. *Columbina*, from Lat. *columbinus*, dove-like, from *columba*, dove). (1) A conventional character in old Italian comedy and the pantomime, first appearing about 1560. She was the daughter of Pantaloon and the object of Harlequin's adoration, and so ap-

pears in English pantomime. See PANTOMIME. (2) A wild flower, emblematic of forsaken lovers, in old English verse.

"The columbine in tawny often taken,
Is then ascribed to such as are forsaken."

(Browne's *British Pastorals*. 1613).

COLUM'BITE. A mineral columbate containing some manganese and crystallizing in the orthorhombic system. It has a bluish iridescence, and is of an iron-black, grayish, or brownish color. This mineral occurs in granitic and feldspathic veins in the form of crystals, crystalline granules, and cleavable masses. It is found at various localities in Bavaria, Italy, Finland, Greenland, and in the Ural region; in the United States it is found in greater or less abundance in nearly all of the States bordering along the Appalachian Mountain system, in the Black Hills of South Dakota, and in California and Colorado. It has some slight economic value for the preparation of salts of columbium and tantalum, but as only small quantities of these salts are used, the mineral is in but little demand. It is interesting to mention that the first occurrence of columbite in America was made known from a specimen sent by Governor Winthrop of Connecticut to Sir Hans Sloane, then President of the Royal Society of Great Britain.

COLUM'BIUM (Neo-Lat., from *Columbia*, United States of America) or **NIObIUM**. A metallic element discovered by Rose in 1846. It is found in the minerals columbite, from Hadam and Middletown, Conn., and tantalite, from near Falun and elsewhere in Sweden; also in small quantities in other minerals. In order to obtain the element the mineral is fused with acid potassium sulphate; the resulting mass, which is washed and boiled with concentrated hydrochloric acid, yields the hydroxide, which is then reduced. Columbium (symbol *Cb* or *Nb*, atomic weight 94) is a steel-gray powder with a specific gravity of 7.06. It forms three oxides with oxygen, of which the pentoxide, Cb_2O_5 , forms salts called *columbates* or *niobates*.

COLUM'BUS. A city and county-seat of Muscogee County, Georgia, 135 miles southwest of Atlanta, at the head of navigation on the Chattahoochee River and on the Central of Georgia, the Southern, and the Seaboard Air Line railroads (Map: Georgia, B 3). The city, from its important manufactures called the 'Lowell of the South,' is the centre of a fertile agricultural region, and has vast water-power, the river having at that place a fall of 120 feet in three miles. The trade with adjoining States is extensive. Columbus receives annually 150,000 bales of cotton, and its manufactures of cotton goods are correspondingly large. It has also foundries and machine-shops, cottonseed-oil mills, refineries, barrel-factories, etc. There is a public library, besides one, the Eagle and Phenix, for mill operatives. The government is administered under a charter of 1890 by a mayor, elected for two years, and a city council whose members are elected on a general ticket. The executive has the power of appointment only in standing committees; all other officials are chosen by the council. Population, in 1890, 17,303; in 1900, 17,604.

Columbus was laid out in 1828 and incorporated in 1829. During the Civil War it was

an important Confederate depot of supplies and was only surpassed by Richmond in the quantity of manufactured articles furnished to the Confederate Army. It was captured by Federal forces April 16, 1865.

COLUMBUS. A city and county-seat of Bartholomew County, Indiana, 41 miles south by east of Indianapolis; on the east fork of the White River, and on the Pennsylvania and the Cleveland, Cincinnati, Chicago and St. Louis railroads (Map: Indiana, D 3). It has extensive manufactures of pulleys, tanned leather, threshing and sawmill machinery, tools, starch, flour, furniture, etc. Settled in 1821, Columbus was chartered as a city in 1864. The government is vested in a mayor, elected biennially, and a city council. The water-works and electric-light plant are owned and operated by the municipality. Population, in 1890, 6719; in 1900, 8130.

COLUMBUS. A city and the county-seat of Cherokee County, Kan., 50 miles south of Fort Scott; on the Saint Louis and San Francisco; the Missouri, Kansas and Texas; and the Kansas City, Fort Scott and Memphis railroads (Map: Kansas, H 4). It is the centre of a farming and a mining region, has a considerable trade in agricultural products, and contains machine-shops, canning factory, and an extensive brick-making plant. The water-works are owned and operated by the municipality. Population, in 1890, 2160; in 1900, 2310.

COLUMBUS. A city and the county-seat of Lowndes County, Miss., 125 miles west of Birmingham, Ala.; on the Tombigbee River, which is navigable six months of the year, and on the Mobile and Ohio and the Southern railroads (Map: Mississippi, J 3). It is the centre of a coal and iron region, and has cotton and oil mills, foundries and machine-shops, stove-works, and lumber-mills. The city has a public library, and is the seat of the State Industrial Institute and College for young women, Franklin Academy, for white, and Union Academy, for negro children. Columbus was settled in 1830, incorporated in 1832, and is governed at present under a charter of 1884, which provides for a mayor, elected every two years, and a council, elected on a general ticket. The water-works are owned and operated by the city. Population, in 1890, 4559; in 1900, 6484.

COLUMBUS. A city and the county-seat of Platte County, Neb., 92 miles west by north of Omaha; on the Loup River a short distance above its confluence with the Platte, and on the Union Pacific and the Burlington and Missouri River railroads (Map: Nebraska, G 2). It is of importance as a railroad junction, and has flour-mills, foundry, brewery, shoe-factory, etc. Population, in 1890, 3134; in 1900, 3522.

COLUMBUS. The capital of Ohio, county-seat of Franklin County, and the fourth city of the State in population, situated on both sides of the Scioto River, 100 miles northeast of Cincinnati and 140 miles southwest of Cleveland, near the geographical centre of the State (Map: Ohio, D 6).

The city is built on generally level ground at an altitude of 750 feet, and has broad, well-paved streets. Among public buildings the most prominent is the State Capitol, a large stone structure fronting on a public square near the centre of the city. The Ohio penitentiary is situ-

ated here. Columbus, well known for the number of its charitable and educational institutions, is the seat of the Ohio State University, founded in 1870 (q.v.); Capital University (Lutheran), established in 1850; Ohio Medical University; Starling Medical College; Columbus Law School, and Columbus Art Institute; and contains five public hospitals—Emergency Hospital, Columbus Hospital for the Insane, Deaf and Dumb Asylum, Blind Institute, Institute for Feeble-minded Youth, and the County Infirmary. In addition to those of the several institutions of learning, there are in the city the State Library and State Law Library, City Library, Public School Library, and Engineers' Institute and Library. Other features of interest may be found in the State fair grounds, which adjoin the city, and in the public parks, bridges, and monuments. There are five parks, including from 10 to 100 acres each, and numerous smaller ones; several street and railway bridges span the Scioto; and monuments have been erected in honor of Salmon P. Chase, William T. Sherman, Edwin M. Stanton, James A. Garfield, Philip H. Sheridan, Ulysses S. Grant, and Rutherford B. Hayes.

Columbus is an important commercial and manufacturing centre. It has excellent transportation facilities, more than a dozen railroads entering the city, including great trunk lines: the Baltimore and Ohio, the Cleveland, Cincinnati, Chicago and Saint Louis, and roads of the Pennsylvania system. In the vicinity are the coal and iron fields of the State, an advantage which has contributed largely to the development of manufacturing industries. There is considerable trade in bituminous coal, and the city is an important distributing centre with large wholesale interests. It exports extensively its principal manufactured products, among which are vehicles of various kinds, wheelbarrows, scrapers, agricultural implements, mining machinery, shoes, uniforms, and regalia. There are also many smaller industries.

The government is administered by a mayor, chosen every two years and ineligible to serve three terms in succession, a unicameral city council, elected by wards, and a board of public works appointed by the executive. This board, composed of directors of law, accounts, public improvements, and public safety, constitutes a legislative body in which all important measures must originate and be approved before action by the municipal council. The director of law is acting mayor in case of the mayor's absence or disability. Officials of other departments are chosen by the people: the board of education, consisting of a representative from each ward; police judge and clerk; and four civil magistrates (justices of the peace). The annual budget of the city approximates \$3,000,000.

Population, in 1830, 2435; in 1850, 17,882; in 1870, 31,274; in 1880, 51,647; in 1890, 88,150; in 1900, 125,560, including 12,300 persons of foreign birth and 8200 of negro descent.

Columbus was laid out in 1812, the Legislature having selected the site for the capital city, and in 1816 it was incorporated and supplanted Chillicothe as capital of the State. It became the county-seat of Franklin County in 1824. In 1833, and again in 1849-50, it suffered greatly from ravages of cholera. Consult Howe, *Historical Collections of Ohio* (Columbus, 1889-91).

COLUMBUS. A city and the county-seat of Colorado County, Tex., 110 miles southeast of Austin; on the Colorado River and on the Southern Pacific Railroad (Map: Texas, F 5). It has a considerable trade in cotton, agricultural produce, live stock, hides, etc. Population, in 1890, 2199; in 1900, 1824.

COLUMBUS, BARTHOLOMEW (BARTOLOMEO COLON) (c.1445-1514). A brother of Christopher Columbus. He was a sailor by profession, and in the year 1480 joined Christopher at Lisbon. In 1489 he was sent to England by his brother to seek assistance from Henry VII. for the execution of his project. He was taken by pirates and landed in England in a destitute condition, and on presenting himself at Court was unfavorably received by the King. He then sought help at the Court of Charles VIII. in France, with like success. In January, 1494, he returned to Spain and was given command of a fleet of three caravels sailing for Española. He arrived there in June of the same year, just in time to render effectual assistance to his brother, who was being hard pressed by the unruly members of the little Spanish colony. From that time on he became the most devoted follower of the Admiral, who in 1495 made him *adelantado*, or governor, of Española, a title which was confirmed by the Crown in 1497. In March, 1496, he assumed command of the colony on the departure of his brother. He founded the town of San Domingo and effectually repressed a native insurrection. During the hardships of the last voyage of Christopher Columbus, Bartholomew proved of invaluable assistance. At Puerto la Gloria in 1504 he repressed a mutiny among the sailors. Late in life he received some recognition for his services from the Crown, which bestowed on him the island of Mona, near Española, as a possession. He died at Seville in December, 1514.

COLUMBUS, CHRISTOPHER (the usual English form, adopted from the Latinized form of the Italian Colombo, which was the original spelling of the family name. After the discoverer entered the Spanish service he became known as Cristóbal Colón) (c.1446-1506). The discoverer of America. Columbus was born in 1445 or 1446. The best authorities surmise that his birth took place in the village of Terrarossa, near Genoa, to which city his father, Domenico Columbus, removed about 1451, in order to be nearer the centre of the wool trade, from which he derived his livelihood. The exact date of Columbus's birth has been a subject of debate, opinions varying from 1436 to 1457, but the most trustworthy evidence seems to show that he was born not long before March 25, 1446. He was early apprenticed to his father's trade, and is referred to in legal documents dated 1472 and 1473 as living in Genoa or Lavona, and engaged in the wool trade. There is probably no foundation in fact for the stories which describe him as having received a university education at Pavia. He probably left home and went to sea in 1473, visiting various Mediterranean ports and eventually reaching Lisbon, where he lived until 1484 or 1485. After he had become famous, stories relating exploits of his early youth as a corsair and pirate, or as pilot or commander of a war vessel belonging to René d'Anjou, Count of Provence, became current, but most of the details

of these stories are inconsistent with known historical facts. The Portuguese were at this time the most skillful sailors in Europe, and among them Columbus may easily have acquired all the knowledge and skill which his later career reveals. He engaged in the business of map-making, besides participating in several expeditions to Guinea, on the African coast, to the eastern Mediterranean, and to England, all of these being voyages which Portuguese merchant vessels were accustomed to make frequently. Slightly more unusual and adventurous was a voyage, to which the definite date 1477 is assigned, to the island of Thule or Iceland.

Columbus's interest in cartography explains his writing a letter concerning the shape of the earth to the learned Italian Toscanelli, accompanying it with one of his globes to illustrate his queries. This elicited the famous reply from Toscanelli, which is ordinarily accepted as marking the time when Columbus began to devote himself to the problem of a direct route from Europe to the Asiatic spice-lands. During one of his Mediterranean voyages he revisited Genoa, it is sometimes maintained, and tried to secure financial assistance which would enable him to test his theories of a direct ocean passage across the Atlantic to Asia, but without success. It is reported also that he tried to enlist help in Venice, and there is nothing improbable in the story. In Portugal, where he had married Philippa Moniz or Muñiz, who is said to have been a daughter of Bartholomé Perestrelo, the first governor of Porto Santo, in the Madeiras, and a prominent figure in the history of Portuguese expansion, Columbus secured the ear of the King, who evinced much interest in his plan. The would-be discoverer, however, demanded so large a share of the prospective benefits that the King, who would have had to stand all the financial risk and the burden of popular disappointment in case of failure, was unable to make terms with him. As no compromise could be arranged, the King was persuaded by his courtiers to test the plan of Columbus by sending a vessel to see if the Atlantic offered any insuperable difficulty to the proposed voyage. An adventurer from Madeira, Fernam Dominguez do Arco, had petitioned the King for a grant of the lordship over an island in the west which persistent rumor declared could be seen from the Azores at certain seasons. Dominguez do Arco was therefore sent off to search for his island, and when he returned unsuccessful, with terrifying tales of the dangers of the great ocean, the King was convinced that the scheme of Columbus was chimerical. Columbus felt that an attempt had been made to cheat him of his great idea, and so he hastily went to Spain, in the winter of 1484-85, leaving his wife and young children behind.

During the next five years Columbus was in constant attendance about the Spanish Court, practicing his profession of cartographer and seeking to gain the royal interest in his plans. During 1486 and 1487 he succeeded so far as to have two important councils held, at Salamanca and at Granada, at which his propositions were discussed by the principal ecclesiastical and political dignitaries. The consensus of opinion was strongly against him, and Columbus, thoroughly discouraged, reopened negotiations with Portugal, which he revisited in 1488, being present at the return of Dias from the Cape of Good



CRISTOFORO COLOMBO

NATO M·CCCC·XLII

MORTO M·D·VI

CHRISTOPHER COLUMBUS

FROM THE BUST IN THE CAPITOLINE PICTURE GALLERY, ROME

Hope. It is supposed that his wife had died before this time, for his son Ferdinand, by Beatriz Henriquez, was born at Cordova in August, just before his visit to Portugal. Realizing the hopelessness of securing assistance in Portugal, Columbus induced his brother Bartholomew to go to England to lay his plans before King Henry VII., while he himself determined to try his fortune in France. The famous story is well authenticated which tells how he started off afoot with his little son Diego and stopped at the convent of La Rábida to ask for food. The prior, Juan Perez de Marchena, entered into conversation with the stranger, grew interested in him, called in a neighbor who was learned in maritime affairs, and eventually became convinced that Spain ought to benefit by the idea with which Columbus had become possessed. A messenger was sent off to the Court, Queen Isabella's interest was aroused, and Spanish America was the result. As soon as the royal support was granted, preparations for the voyage were hurried forward. The Pinzon brothers, merchant sailors of Palos, furnished the money for the share in the expense which Columbus had undertaken to provide, and the royal contribution of Queen Isabella was advanced by the Treasurer, Santangel, from his private resources. The story that the Queen pawned her jewels to secure this money is rendered unlikely by the fact that she had pledged everything she possessed, several years before, to assist in the war against the Moors.

On August 3, 1492, everything was ready and Columbus, on the carack *Santa Maria*, accompanied by the caravels *Niña* and *Pinta*, sailed from Palos. A short stop was made at the Canaries, and then a course was steered due westward. Several days of calms followed, during which Columbus, foreseeing trouble with his crew, began to announce each day as the number of leagues sailed about three-fourths of the real distance. On September 14th he noticed that the compass, which had previously, as in European waters, pointed to the east of the pole-star, was beginning to point west of it. This discovery of the variation of the needle is the first of a series of observations which, after the accumulated information of four hundred years, still puzzles physicists. On October 8th, on the advice of Pinzon, who was captain of the *Pinta*, the course was changed to the southwest, and on the 12th land was reached. This was an island known to the natives as Guanahani, and named by Columbus San Salvador, probably the one now called Watling's Island, one of the Bahamas. The landfall has been a subject of long dispute, and investigators have at various times advocated the modern San Salvador, Cat, Grand Turk, Samana, and Acklin islands as the land on which Columbus first set foot in the New World. From San Salvador, Columbus sailed from island to island until October 26th, when he landed on Cuba. Having convinced himself by several trips into the interior that this was a part of the Asiatic mainland, or Cathay, he started back toward Spain. On Christmas Eve, as he was crossing to Haiti, which the Spaniards named Española, the *Santa Maria* was wrecked near the harbor named by Columbus 'La Navidad.' It was therefore decided to leave at this spot, in a fort which was built there, a part of the company, to serve as a nucleus for future exploring expeditions. Forty men agreed to stay, and were left with

sufficient supplies, and on January 4, 1493, Columbus set off for Spain. On February 25th he entered the mouth of the Tagus, having been nearly wrecked in a storm which arose after the shores of Europe had been sighted. The Portuguese King welcomed him cordially and helped him to send word to Spain of his safe return. From Palos Columbus journeyed overland to the Court at Barcelona, where he arrived in April and was received with great honor by Ferdinand and Isabella.

Every assistance was promised Columbus toward equipping a second expedition. Seventeen vessels were soon ready, carrying 1500 persons, and on September 25, 1493, they set sail. The island of Dominica was reached on November 3d, and on the 27th Columbus anchored off the fort of La Navidad, which was found deserted. The garrison had been killed by the natives, whom the outrages committed by the white men had provoked beyond endurance. Abandoning this, Columbus founded a new town (Isabella) and the next two years were spent in an attempt to establish a form of government and in several exploring expeditions into the interior of Española and the neighboring islands. Many causes united to disturb the peace of the colony, and Columbus at length determined to return to Spain, where his enemies were actively trying to undermine the confidence of the sovereigns in him. Landing at Cadiz on June 11, 1496, he proceeded directly to the Court, where he was most graciously received and quickly restored to grace. He was promised whatever he desired for a new expedition, but there was a long delay, due largely to the persistent opposition of Fonseca, Bishop of Palencia, through whose hands everything had to pass before Columbus could secure his outfit. It was not until May 30, 1498, that six vessels were ready to sail. A more southerly route than before was followed and the voyage was prolonged until July 31st, when the three peaks of Trinidad were sighted. After a fortnight's rest in the Gulf of Paria, Columbus coasted the South American mainland, which he now saw for the first time, westward as far as Margarita, and then, having first decided that Paradise must be situated in the interior of the modern Venezuela, he stood across to Española. Arriving at Santo Domingo, which had become the principal town in the Indies, he learned that a number of the colonists had rebelled during his absence, and that everything was at odds. His temperament was ill-suited to dealing with the turbulent crowd who defied his authority, and he could do little toward restoring peace and order. Both sides sent agents and emissaries to Spain, with the result that, on August 23, 1500, Francisco de Bobadilla arrived at the island with royal orders authorizing him to supersede Columbus in the government. Without waiting to investigate the charges against him, Bobadilla arrested Columbus, treating him with heartless indignities for which no justification can be found in the surviving records of the colony. He was placed in irons, denied visits from his brothers and partisans, and in October sent back to Spain.

The news that the Admiral of the Ocean Seas had arrived home in chains served his cause better than any argument. He was promptly released and summoned to Court, where every favor was shown him. King Ferdinand, how-

ever, was too shrewd to restore him to the full powers of control which he claimed by virtue of his discovery. As soon as he became convinced that there was little use in trying to secure his rights, Columbus asked for a fleet with which to continue his discoveries. This was readily granted, and in May, 1502, he set sail with four caravels to seek a route to the real East. A part of the royal grant was the condition that he should not revisit Española, but on June 29th Columbus anchored off Santo Domingo. Being forbidden to enter the harbor, he refitted as best he could outside, where he successfully weathered a storm which, curiously enough overwhelmed a fleet on which Bobadilla and several of his bitterest enemies had set sail for Spain. Columbus proceeded westward, and between July 30, 1502, and January 24, 1503, he sailed along the coast of Central America, from Honduras to Veragua, where he attempted a settlement. In April, 1503, the disheartened survivors insisted on abandoning the enterprise. With the greatest difficulty the rotten ships were brought as far as Jamaica, where, in August, they had to be beached to save their cargoes. The Admiral had been confined for many weeks to his bed, with a complication of mental and bodily ailments, from which he aroused himself at moments of special danger to show his earlier courage, enthusiasm, and skill. From Jamaica a messenger, Diego Mendez, started across to Cuba in a canoe to seek help at Santo Domingo. It was many months before the pitiful survivors learned that he had not perished on the way. He reached Española in safety, but Ovando, who had succeeded Bobadilla, delayed as long as he could before permitting Mendez to hire a vessel to go to the rescue of the castaways on Jamaica. At last, in June, 1504, the survivors who had remained faithful to the Admiral through dangers and disasters were once more embarked on their way back to civilization. Refitting the vessel at Santo Domingo, Columbus proceeded to Spain, landing at San Lucar de Barrameda on November 7. Before the end of the month, Queen Isabella, upon whom all his hopes rested, died. Columbus went to Seville, where he busied himself during such intervals of freedom from pain as he had in trying to put his affairs in order, and in writing letters to all whose friendship or help he craved. In May, 1505, he vainly journeyed to Segovia to plead with the King for some recognition of his rights and those of his son. Thence he retired to Valladolid, where he died, May 20, 1506.

Columbus literature, already very voluminous, was more than doubled during the celebration of the four hundredth anniversary of his discovery of America in 1892. The chief source for information about him was for many years Navarrete's great collection of documents, published at Madrid between 1825 and 1837. This has been in a measure supplanted by a monumental work published by the Italian Government, *Scritti di Colombo* (Rome, 1892). The standard English version of the *Letters* is Major's translation in the Hakluyt Society volumes for 1848 and 1870, supplemented by Markham's translation of the *Journal* in 1843. There is a convenient edition of the *Letters* edited by W. C. Ford (New York, 1892). The great critical study of Columbus's life and family is by Harisse, in two volumes (Paris, 1884), the results of which were presented in English by Winsor (Boston,

1892). Among the best of the many shorter biographies are those by Markham (London, 1893), and by Adams (New York, 1892).

COLUMBUS (COLON), DIEGO (in It., *Giacomo*) (c.1468-1515). The youngest brother of Christopher Columbus. He was born probably at Genoa and upon the news of his brother's great discovery came to Spain. He accompanied Christopher on his second voyage, and late in 1493 was at the head of a commission intrusted with the government of Española in the absence of the Admiral. In 1496 he went to Spain to defend his brother against the charges submitted by some of the unruly members of the colony. He returned to Española, but fell into disgrace and was sent in chains to Spain in the year 1500. A number of years before his death he entered the Church.

COLUMBUS, DIEGO (c.1478-1526). Eldest son of Christopher Columbus. He was born probably at Lisbon, and came in 1484 to Spain with his father, who left him for some time with his friends at the Convent of La Rábida, while he himself went to seek aid at the Court. In 1494 he became page to the Crown Prince, Juan, and after the latter's death in 1497 he was admitted into the household of Queen Isabella, where he remained till 1504. After the death of his father he received the title of Admiral of the Indies, but was refused the viceroyalty which he claimed as his paternal right. In 1508 he married a daughter of the house of Alba, and through her influence succeeded in being made Governor of the Indies. In 1509 he arrived at Española to take possession of his office. He never desisted in his claim to the viceroyalty and to a share of the revenues from the New World due him, and in 1520 finally won his case. He was recalled, however, from his government in 1523, and though he made his peace again with the Court, did not return to the New World. He died at Montalban in 1526. His son Luis (1521-72), born at Santo Domingo, received the title of Admiral of the Indies in 1529. He finally abandoned all claims of the family to the viceroyalty and received in compensation an estate in Jamaica and one near Veragua, with the titles of Duke of Veragua and Marquis of Jamaica. In 1563 he was banished on account of his dissolute life to Oran, where he died. With Diego Colon (died 1578), a nephew of Luis and a great-grandson of Christopher, the male line of the great Admiral became extinct. The present Dukes of Veragua trace their descent from a sister of the last Diego.

COLUMBUS, FERDINAND (Fernando) (1488-1539). A natural son of Christopher Columbus by Beatriz Henriquez, of Cordova. In 1498 he became page to Queen Isabella. He accompanied his father on his last voyage to the New World, and in 1509 he sailed for Española with his brother Diego, who had been made Governor of the Indies. Returning to Spain, he settled down as a cosmographer and writer on navigation. He traveled extensively in Italy, the Netherlands, Germany, and France, and in 1522 visited England. Two years later he was a member of the board of arbitration selected to decide on the conflicting claims of Spain and Portugal to the Molucca Islands. His political career was an active one, and mainly in line with his profession as geographer. Two years before his death he

founded a school of mathematics and education at Seville. His library of more than 12,000 volumes he left to the chapter of the cathedral at Seville. Ferdinand is best known as the probable author of a life of his father, upon which all subsequent biographies of Christopher Columbus have been based. We possess this work only in the form of the Italian translation published at Venice in 1571, the original having been lost. Ferdinand's claim to the authorship of this biography has been denied by eminent authorities and just as warmly defended; the question is still a mooted one.

COLUMBUS BARRACKS. A United States military post established in 1863, and originally an arsenal. The reservation embraces 77 acres, and is one mile from Columbus, Ohio, which is the nearest railroad station. It is an important recruiting rendezvous for the United States Army and contains quarters for 25 officers and 8 companies of infantry.

COLUMELLA (Lat., dim. of *columna*, column). A descriptive term employed in several groups of plants, but especially in mosses and molds. It refers to an axis-like structure arising in the centre of a sporangium, so that the spores are forced to lie along its sides.

COLUMELLA, LUCIUS JUNIUS MODERATUS. The most learned of Roman writers on practical agriculture. He was born at Gades (Cadiz), in Spain, and flourished in the earlier part of the first century of the Christian Era. For some time he resided in Syria, but lived chiefly at Rome, and died, most probably, at Tarentum. His great work, *De Re Rustica*, in twelve books—the tenth, *On Gardening*, is versified—is addressed to one Publius Silvinus, and treats of arable and pasture lands, culture of vines, olives, etc., care of domestic animals, respective duties of masters and servants, and the like. A supplementary treatise relates to trees. This ancient *Book of the Farm* is written in good Latin, and the information is copious, though in some points of questionable accuracy. The best edition of Columella is by Schneider, in *Scriptores Rei Rusticæ*. (Leipzig, 1784-97).

COLUMN (from Lat. *columna*, column, connected with AS. *holm*, island). A pillar or post, usually cylindrical in form, made of any material, such as wood, stone, brick, or iron, and used as a support, either real or apparent. In the historic architectural styles the column has held a most important position, often determining both æsthetic and constructive forms. It is used in connection both with the arch and the architrave. Strictly speaking, a column should consist of a shaft, circular in plan, and surmounted by a distinct capital, and it should rest on a base. Exceptionally, as in the Doric style, the base is omitted. Throughout antiquity the column was used mainly as a constructive member, and only exceptionally as a decorative feature; but in the Middle Ages the column formed a large part of the rich system of decoration. Normally, columns stand free and singly, at regular intervals, supporting a superstructure, but there are many variations of such a type. (1) The half or three-quarter column, engaged in a pier or wall, came into use at quite an early date—in Egypt, for example—entered the domain of architecture permanently in the Roman style, and has been common ever since. (2) The

grouping of columns by twos or even threes hardly obtained generally until the Middle Ages, when it was a special feature of cloisters. (3) The simple circular plan was changed for a cluster of shafts in many styles—Assyro-Babylonian, Egyptian, and especially mediæval, when the grouped columnar pier was most characteristic. (4) Honorary columns were quite unconnected with any structure, and were at first entirely religious in significance, like the two columns in front of the Temple of Jerusalem (Jakin and Boaz), those in connection with Phœnician and other Oriental and even Pelasgic sanctuaries, and the many erected in Hellenic countries surmounted by figures or symbols of the gods. Afterwards they were used to commemorate the achievements of men, especially by the Romans, who surmounted them with honorary statues, the most famous being those of Trajan, Marcus Aurelius, and Antoninus Pius in Rome, of Arcadius and Theodosius in Constantinople, of Pompey in Alexandria, and the Vendôme column in Paris.

The shafts of columns were sometimes monoliths, of a single piece, or built up of superposed drums, or with a core of different material from the face. The first was the favorite form of the Romans, the second of the Greeks, the third of the Assyro-Babylonians and Etruscans, of whom the former sheathed a wooden core with metal, while the latter did it with terra-cotta—a method not unknown to the early Greeks. The materials almost universally used throughout historic times have been stone and marble. It is idle to speculate as to the origin of the stone or brick column and whether it goes back to a wooden original. It is certainly true that in the history of Greek architecture the wooden column was a primitive form, as is attested in the Temple of Hera at Olympia, as well as in literary traditions.

Columnar architecture played a very subordinate rôle in the vaulted Assyro-Babylonian style, and appears only in lighter and smaller structures, such as shrines, in antis, and in delicate second-story superstructures, where the shafts were often carried on the backs of sphinxes or lions and surmounted by proto-Ionic or bulbous capitals. The proportions approach more closely to the Hellenic than in Egypt. The Egyptians were the first to utilize columns on a grand scale, especially in the great hypostyle halls of their temples, as early as the Eleventh Dynasty (c.2500 B.C.). They used a great variety of designs and proportions, so that they can hardly be said to have had orders or eanons of proportions, though the shafts were almost invariably heavy, their height varying only from about three to five times their diameter. The shaft usually rests upon a plain, low, circular base, in the form of a plinth, immediately above which it often takes on a pronounced swelling or entasis. Its surface, even when a smooth cylinder, is almost always decorated with brilliantly colored and *caro rilievo* ornaments, in the form of hieroglyphs, patterns, or religious symbols. Often, instead of a smooth cylinder, the shaft is in the form of a bunch of palm or lotus stalks, banded together at intervals by bands of rings, and surmounted by a palm or lotus flower capital, or campaniform capital, on which a square plinth is usually superposed. Another form of shaft, popular only in the middle period

and best seen in the tombs at Beni-Hassan, is the polygonal derivative of the square pier, with sometimes as many as 16 or 32 sides, which suggests the fluting of the classic column. The material used is invariably stone, and the construction is by drums. The Oriental series closes with the Persian column, which is later than the Greco-Ionic and was formed under combined Egyptian, Assyrian, and Ionian influences. The great columnar halls of the Persian royal palaces rivaled the temple halls of Egypt, but produced a totally opposite effect, because the columns were slender and tall (60 to 70 feet), fluted like the Greek, instead of painted and carved, and widely spaced, instead of crowded. The simple Greek type, evident in shaft and base, was not followed in the elaborate three-staged capital—animals, volutes, and campaniform bulbs—evidently inspired by Assyro-Babylonian models. The columns were of stone, but, unlike the Egyptian, the lintels they supported were of wood, which made the slender proportions and wide spacing possible.

The history of the column among the Greeks reaches back to pre-Homeric days, for it appears in the Mycenaean and Achaean royal palaces and tombs in Crete, Mycenae, Tiryns, and elsewhere. No classic orders yet exist, and the shafts, strangely enough, are larger at the neck than at the base. In the seventh century B.C. the two great columnar orders, Doric and Ionic, have developed all important features and reign—the one in Sicily, Magna Græcia, and most of the Greek mainland, the other in Asia Minor and some of the islands, passing then to Attica and other semi-Ionic parts of Greece. These orders are characterized by their special entablature (q. v.), as well as column. The Hellenic appreciation of æsthetic proportions and of ideal types is shown in the early attempt of architects to establish canons for each of these orders. The most startling novelty in the Hellenic use of the column was that it was in the main for external, instead of internal, effect. In the development of Greek architecture there was a continually increasing tendency in favor of the Ionic style. The attempt to give a history of these two orders on the basis of an evolution of form has proved unsatisfactory, except in such general facts that Doric columns gradually lose much of their original heaviness. The Doric column had no separate base, but the entire row rose from a common stepped base. The shaft tapered slightly upward, and the straight outline was mitigated by an outward curve or entasis, most pronounced below the centre: it was fluted with from 16 to 20 channels, meeting in sharp edges, or *arrises*, and was joined to the capital by a grooved necking. The capital itself consists of a circular cushion, or *echinus*, surmounted by a square plinth, or *abacus*, on which the entablature rests. The heavy proportions of early Doric gave the columns a height of only four to five diameters and an intercolumniation of hardly more than a single diameter, but the height was gradually increased until it reached six to seven diameters and the intercolumniation increased—a change corresponding to a lightening of the entablature. The Doric column usually had a thin coat of stucco, painted a delicate buff. The Ionic column was far more graceful and decorative. Its slenderness allowed of far less tapering and entasis of the shaft, which rested

on a base. This base at first varied in type and was especially rich in Asia Minor before taking the normal Attic form which remained the typical base even in post-classic times. The height of the column was from eight to ten times its diameter; its shaft had 24 deep flutings, separated by narrow fillets. The capital consisted of spiral connected volutes, between which was a cyma, or ovolo, with pearl beading, and it was connected with the architrave by a thin, decorated plinth. Carving and color contribute to form the decoration. In Greek times the Corinthian style hardly rose to the dignity of an order, its only important change from the Ionic being in the different capital. It is interesting to notice that the Greeks merely blocked out their columns before erecting them, and only after the building was fully constructed were the channels, moldings, and ornaments cut. When marble came into use, in the fifth century, the surface was no longer stuccoed.

The Romans abandoned, in the third century B.C., the wooden columns with terra-cotta sheathing of the Etruscans for the solid columns of the Greeks, but introduced several variations. The principal of these variations were the frequent use of unchanneled and monolithic shafts of the brilliantly colored marbles, like the Numidian, porphyry, or serpentine; the general use of the Corinthian, instead of the two simpler capitals, and the development of a real Corinthian order; the modification of the Doric into the so-called 'Tuscan' style; the invention of the Composite capital, of high pedestals, of engaged columns, and of a rich system of sculptured decoration. The column was now, for the first time, combined with the arch, as well as with the architrave. Thus the Romans increased the uses, the size, the materials, and the types of columns, though losing much of the refinement of form and proportions of Greek art. At the same time, especially in their civil public buildings, the Romans substituted heavy piers—often with engaged columns—for the columns themselves, on account of the use of vaulting, which could not be supported by slender shafts. It was reserved for Early Christian architecture to develop the use of the column with the arch in interiors, especially in the basilicas (q.v.) and other churches, and in baptisteries. No new forms were invented in the West, where there was a gradual decline in the quality of columnar architecture; but in the East the Byzantine and other schools added to the old types of capitals many new ones, such as basket and foliated capitals, and commenced the fashion of wall colonnettes, which was so popular in the Romanesque and Gothic styles, to the great enrichment of wall surfaces. The plundering and destruction of ancient buildings, for the sake of using their materials in new constructions, helped at the same time to keep alive the knowledge of the old orders, especially in the West. The reign of the column was henceforth sharply contested by the pier, which became the principal constructive support in Byzantine art. The use of the two forms—pier and column—was about equally balanced in Italy and Germany: the pier was more popular in France and England. For a short time the Gothic style adopted the columns for its main supports, but substituted finally the grouped pier as stronger and more in constructive and formal harmony with the molded

ribbings of arch and vault. The column continued to reign, however, in nearly all other cases. There were no longer any orders or received canons of proportion. All natural forms of foliage and flowers, all known geometric and formal patterns were used in the capitals; the Ionic base, while used as the norm, was infinitely varied: the shafts were hardly ever channeled; sometimes they were monoliths, sometimes built up. Only in such Italian provinces as Rome and Tuscany did much of the old classic design survive. Certain variations in the shafts, such as twisted, spiral, knotted, foliated shafts, of which glimpses had been seen in the Roman and Byzantine periods, became common in the Middle Ages, and appear especially in subordinate structures, such as cloisters (q. v.).

The originators of the Renaissance style vacillated for a while. Brunelleschi, its founder, used the column in his two principal churches, but though it was retained in palace courts and cloisters, it was almost immediately and finally displaced by the pier—a heavier pier than the Gothic. The column became largely a decorative feature, and was used freely, engaged in piers and walls. The Neo-Classic style employed the column on a grand scale in façades resembling the Pantheon, on exteriors copied from Greek peripteral temples, and in colonnades resembling the old basilicas. In modern architecture the column plays but a very subordinate rôle, either constructive or decorative. Consult, in general: Ruskin, *Stones of Venice*, vol. i. (London, 1853); Longfellow, *The Column and the Arch* (New York, 1899); Gwilt, *Encyclopædia of Architecture* (London, 1899). For the classic orders, see Vitruvius, *De Architectura Libri* (translated by Gwilt, London, 1826); Bötticher, *Die Technik der Hellenen* (Berlin, 1874-81); Bühlmann, *Die Säulenordnungen* (Stuttgart, 1893). For the Romanesque and Gothic column, see Dehio and Von Bezold, *Die kirchliche Baukunst des Abendlandes* (Stuttgart, 1887-94).

COLUMN. As defined by the *United States Infantry Drill Regulations*, a military formation in which the elements are placed one behind another, whether these elements are files, fours, platoons, or larger bodies. When a regiment is on the march, and each company marching in column of fours, it is said to be 'in column of route.' The same formation may be adopted by any number of troops in a command. When the science of war was in its infancy, dense column formations were the usual order of battle, much reliance being placed upon it by every European nation except England, who invariably preferred its opposite, the 'line' formation. See **TACTICS, MILITARY; MARCHING; ADVANCE GUARD; ARMY ORGANIZATION; REAR-GUARD.** The composition and operation of a column of ships in naval warfare or manœuvres will be found treated under **TACTICS, NAVAL.**

COLUMNA ROSTRATA. A column set up in the Roman Forum to commemorate the naval victory of Gaius Duilius over the Carthaginians in B.C. 260. It was of marble, adorned with the prows of the captured ships. The column having been destroyed by lightning, a new column was erected by Claudius, with an inscription now preserved in the Conservatori Palace.

COLUMN OF JULY. See **JULY, COLUMN OF.**

COLUMN OF MARCUS AURELIUS. See **ANTONINE COLUMN.**

COLUMN OF PHOCAS. See **PHOCAS, COLUMN OF.**

COLUMN OF SAINT MARK. See **VENICE.**

COLUMN OF TRAJAN. See **TRAJAN'S COLUMN.**

COLUMNS OF HERCULES. See **HERCULES, PILLARS OF.**

COLUMN VENDÔME, vîn'dôm'. See **VENDÔME, PLACE.**

COLVILLE, kôl'vil (from the town of *Colville*, Wash.). A former important Salishan people, calling themselves Shwoyelpi, originally occupying the country on Columbia River about Colville and Kettle rivers, northeastern Washington. The great salmon-fishing resort of Kettle Falls was within their territory, and here, in 1846, was established the Jesuit mission of St. Paul, through the influence of which nearly all the upper Columbia tribes are now Christianized. They were put upon a reservation (Colville) in 1872, and have since rapidly decreased, having dwindled from 616, in 1870, to 298, in 1900.

COLVIN, kôl'vîn, SIDNEY (1845—). An English author, born at Norwood, Surrey. He graduated in 1867 at Trinity College, Cambridge, was elected a fellow of the college in 1868, and, having become Slade professor of fine arts at Cambridge, in 1873, held that post by successive reflections until 1885. In 1876-84 he was also director of the Fitzwilliam Museum of the university. He was appointed keeper of prints and drawings in the British Museum in 1884. His contributions to periodicals on the history and criticism of literature, and more largely of the fine arts, are numerous and valuable. His published works include the volumes on *Walter Savage Landor* (1881) and *John Keats* (1887) in the "English Men of Letters" series; *A Florentine Picture and Chronicle* (1898); *The Early History of Engraving in England* (1901); and editions of *Selections from the Writings of Walter Savage Landor* (1882; in the "Golden Treasury" series), of the *Letters of Keats* (1887), and of the *Papers of Fleeming Jenkin* (1887; with J. A. Ewing). His labors in connection with the preparation of the standard Edinburgh edition (27 volumes, 1894-98) of the works, and the edition of the collected *Letters* (2 volumes, London, 1900; preceded in 1895 by *Vailima Letters*) of his friend, Robert Louis Stevenson, made him an authority on that author. He also wrote the sketch of Stevenson for the *Dictionary of National Biography* (vol. liv.), and was to have written the authoritative *Life*, intended for publication simultaneously with the *Letters*, but was obliged to relinquish the task to Graham Balfour.

COLWELL, STEPHEN (1800-72). An American author and philanthropist, born in Brooke County, West Va. He graduated at Jefferson College, Pa., in 1819; was admitted to the bar of Virginia in 1821; and practiced in Pittsburg until 1831, when he engaged in the iron business in Philadelphia, and began writing for the press, particularly on questions of politics and social science. He gathered a large library, which he left to the University of Pennsylvania, where he also endowed a chair in social science. During the Civil War he was an active supporter of the

Union, and at its close was appointed a commissioner to revise the internal revenue system. Besides numerous contributions to commercial and financial periodicals, he published, among other works: *Politics for American Christians* (1852); *Position of Christianity in the United States in Its Relation with Our Political System and Religious Instruction in the Public Schools* (1855); and *The Ways and Means of Commercial Payment* (1858).

CO'LY. See MOUSE-BIRD.

COLZA, or COLESEED. See RAPE.

CO'MA (Neo-Lat., from Gk. *κῶμα*, *kōma*, deep sleep, from *κοιμᾶν*, *koiman*, to put to sleep, from *κείσθαι*, *keisthai*, to lie; connected with Lat. *quies*, rest). A state of profound insensibility differing from natural sleep in that the patient cannot be aroused from the stupor. The patient's eyes are closed, his pupils are either large or small, his face is generally flushed and the conjunctivæ red, the breathing deep, labored, and stertorous. Coma may accompany and be caused by alcoholic intoxication, morphine poisoning, apoplexy, Bright's disease, epilepsy, heat-stroke, certain fevers, etc. In the coma from opium or morphine the patient should be aroused if possible, and kept walking and awake, by various means; but in coma from all other causes he should be kept absolutely quiet in bed. Therefore it is very necessary to know exactly what trouble must be treated, and no layman can judge of the proper remedial measures. The coma from alcoholic intoxication is so frequent and well known that very often the coma of serious conditions is mistaken for mere drunkenness.

CO'MA BER'ENI'CES (Lat., Bergence's hair). A small and close cluster of stars near the equinoctial colure, south of the tail of the Great Bear. This cluster of stars has been measured very carefully by Chase with the heliometer of the Yale College Observatory, and photographically by Kretz, at Columbia University, New York, the measures being made upon negatives by Rutherford.

COMACCHIO, *kō-māk'kē-ō* (Lat. *Comaculum*). A fortified town in the Province of Ferrara, in northeast Italy, situated on the southernmost of the lagoons at the mouth of the Po (Map: Italy, G 3). It is built on thirteen islands that are connected by numerous bridges, and the lagoon communicates by a canal with the little port of Magnavacca, on the Adriatic. The majority of the inhabitants are engaged in the raising of fish—particularly eels—for the market, and in the manufacture of salt. Population (commune), 1881, 9974; in 1901, 10,877.

COMANA (Lat., from Gk. *Κόμανα*, *Kōmana*). (1) **COMANA OF CAPPADOCIA**, an ancient city, situated in a deep valley of the Anti-Taurus range, through which the river Sarus flows. It was celebrated as the place where the rites of the goddess Ma (the Greek Enyo, or Artemis, and the Roman Bellona) were celebrated with much solemnity and great magnificence, in a spacious and sumptuous temple, to which the city was scarcely more than an appendage. It was governed by the chief priest, who took rank next to the king. It is reported that in Strabo's time more than 6000 persons were engaged in the temple affairs. The festivals attracted large

gatherings. (2) **COMANA IN PONTUS**, an ancient city of Asia Minor, on the river Iris, the modern Tocat-su. It was an important commercial city, and the seat of the worship of the goddess of the moon, whose cult was carried on with ceremonies analogous to those employed in the Cappadocian Comana (see above). Its ruins, consisting of fragments of brick and hewn stone and remains of walls, are still to be seen near the village of Gumenek. The town is said to have been colonized from the Cappadocian Comana.

COMANCHE, *kō-mān'chē* or *kō-mūn'chā* (of unknown signification, first applied to the tribe by the Spanish Mexicans), an important tribe of Shoshonean stock, formerly ranging jointly with the Kiowa (q.v.), along the southern plains from the Arkansas River to central Texas, and extending their forays far down into Mexico. Up to the surrender of the last hostile band, in 1875, they were the constant scourge of the Mexican and Texan frontier. They are a southern offshoot of the Shoshoni proper, the language of the two tribes being the same. Like other tribes of the same stock, their organization is very loose, and they are singularly deficient in religious ceremonial. On the other hand, they bear a high reputation for honesty and direct methods. They now number 1400, in western Oklahoma, their reservation, which was occupied jointly with the Kiowa and Kiowa Apache, having been thrown open to settlement in 1901.

COMAYAGUA, *kō'mā-yū'gwā*. The capital of the Department of the same name, Honduras, on the Rio Humaya, 37 miles northwest of Tegucigalpa (Map: Central America, D 3). It is situated in a fertile valley, but has little trade. It is an episcopal see, and the cathedral, dating from the early eighteenth century, is the most notable building. Population, about 3,000. Comayagua appears first in history, under the name Valladolid la Nueva, about the middle of the sixteenth century, and Indian relics found in the vicinity testify to its antiquity. In 1827, then having nearly 20,000 inhabitants, Comayagua was sacked by the Guatemalians. Until 1880 it was the capital of the Republic.

COMB (AS. *camb*, Icel. *kamb*, OHG. *chamb*, Ger. *Kamm*, comb; connected with Gk. *γόμφος*, *gomphos*, peg, OChurch Slav. *zqdū*, Skt. *jambha*, tooth). Combs seem to have been used by the ancients rather for adjusting than for fastening the hair, the pin, or bodkin (*acus*), having chiefly been employed for the latter purpose. Both the Greek and Roman combs were generally made of boxwood, obtained from the shores of the Euxine; but later, ivory combs, which had long been used by the Egyptians, came into general use among the Romans. The precious metals were also used for this purpose, as we may infer from the golden combs ascribed to the goddesses; but this was probably rarer in ancient than in modern and mediæval times, from the circumstance of the comb not having then been used as an ornamental fastening. Of the early use of gold combs in Great Britain we have a reminder in the well-known ballad of "Sir Patrick Spens:"

"O lang, lang may their ladies sit,
Wi' their gowd kames in their hair."

Combs have been found in Anglo-Saxon graves of both men and women, showing how much attention they paid to the hair. In early times

the comb had a place in the church service. Careful ritualistic directions have been found for combing the abbot's hair in the sacristy before vespers and other services. In the tombs of the martyrs in the catacombs combs of ivory and boxwood have been found, which testify to this ancient custom of the priests arranging their hair before the altar.

An ancient Irish long rack comb is in the museum of the Royal Irish Academy. The sides are hog-backed, and between them are set the pectinated portions, varying in breadth from half an inch to an inch and a quarter, according to the size of the bone out of which they were cut. The whole is fastened together with brass pins riveted. By this contrivance, any damaged portion could easily be replaced.

Modern combs are made of tortoise-shell, ivory, horn, wood, bone, metal, india-rubber, and celluloid. The material is first made into plates of the size, shape, and thickness of the comb, and then the teeth are cut. The old method of cutting the teeth is by the *stadda* or double saw, which has two blades of steel set parallel to each other, with a space between them equal to the thickness of the intended tooth. Combs with 50 or 60 teeth to the inch may be cut in this manner. The teeth are then thinned, smoothed, and finished by means of thin, wedge-shaped files.

Many combs are now made by a method called 'parting.' By the process of cutting, above described, the material corresponding to the spaces between the teeth is of course wasted; by the method of parting, this is made available to form the teeth of a second comb. The plate of horn, tortoise-shell, etc., is cut through by means of a stamping-cutter, whose essential features consist of two thin chisels inclined to each other, which represent the edges; between these, and connecting the ends, is a small cross-chisel. When this compound cutter descends with sufficient force upon the plate it will cut one of the teeth. By simple machinery, the table carrying the plate is made to advance a distance equal to the thickness of one tooth while the cutter is rising, and thus the successive cuts are made. A slight pull is now sufficient to part the plate into two combs, the teeth of which only require filing and finishing. India-rubber combs are manufactured by pressing the caoutchouc to the required form in molds and 'vulcanizing' or combining it with sulphur afterwards. By this means a high degree of hardness can be obtained.

COMB, or COOMB. An old corn measure, containing four bushels. In many localities hollows or valleys among hills are called combs or coombs.

COMBA, kōm'ba, EMILIO (1839—). An Italian writer, born at San Germano Chisone. As professor at the Istituto Valdese, at Florence, he, in 1873, founded the review entitled *Rivista Cristiana*, a work of a somewhat polemical nature devoted to a discussion of religious topics. The history of religious reform in Italy is well described in the interesting works entitled, *Francesco Spiera, Baldo Lubertino, martire della religione e della libertà; Introduzione alla storia della riforma in Italia.*

COMBACONUM, kōm'ba-kō'nūm, or KUMBHAKONAM (Skt., jar-edge, from kumbha, jar + kōna, edge). A town of Madras, British

India, situated within the delta of the Kaveri River, about 30 miles from the sea (Map: India, C 6). It contains a number of interesting temples, gateways, and a gate pyramid nearly 150 feet high, profusely adorned with statuary in stucco. The large reservoir, which is supposed to be filled with water from the Ganges every twelve years by a subterranean passage 1200 miles long, attracts great numbers of pilgrims. The city is regarded as sacred by the natives. There is a considerable commerce and a well-developed weaving industry. The English have established a small college here. Population, in 1891, 54,300; in 1901, 59,700.

COMBAT (Fr., from combattre, to fight, from Lat. com-, together + ML. battre, to fight, from Lat. bature, to beat), SINGLE. Among the early Norsemen, a careful distinction was made between the ordinary single combat, or *einrīgi*, and the *hólm-ganga*, or island duel. The former was unencumbered with rules and traditions, and was a simple fight between two opponents. The other, which received its name from the fact that it was always held on a *hólm*, or island, generally of a river, was accompanied by very elaborate rites and rules, and could be engaged in only under certain circumstances, to be determined by the authorities. It was regarded as a sort of court of final appeal, and at the meeting of every Parliament, or *Thing*, a place for the holding of these official duels was set aside. Many old Norse warriors were famous as fighters of *hólms*, some even receiving nicknames from this circumstance. The *hólm* was abolished by the Icelandic Parliament, about 1006, probably as the result of the recent establishment of a new court of appeal, which made it unnecessary. The *hólm* continued in Norway for a few years longer. Some connection may exist between the *hólm* and the Norman tournaments, and the modern duel, with its formal procedure, represents the same idea in an unofficial form.

COMBE, kōm, GEORGE (1788-1858). A Scotch phrenologist, born in Edinburgh. He entered the legal profession, became a writer to the Signet in 1812, and continued to practice until 1837, when he resolved to devote himself to scientific pursuits. He published his *Essays on Phrenology* in 1819, five years later his *System of Phrenology*, and in 1828 *The Constitution of Man Considered in Relation to External Objects*. Combe contributed largely to the *Phrenological Journal* (20 vols., 1824-47). Besides the works mentioned, he wrote on ethics, education, politics, economics, and theology. He also traveled in America and Germany, and published *Notes on the United States of North America* (3 vols., 1841); *Notes on the Reformation in Germany* (1846); and *The Relation Between Science and Religion* (1857). In his day his writings were popular, but they have no importance now. For his *Life*, consult Gibbon (London, 1878).

COMBE, WILLIAM (1741-1823). An English author. He was born at Bristol, and was educated at Eton and at Oxford, which he left without a degree. After rapidly spending a small fortune that had been left him, he settled in London as a law student and hack writer. In 1776 he published his "*Diaboliad*, a poem dedicated to the worst man in his Majesty's dominions." By his pen he earned a precarious living, and

spent a good deal of his time in prison. He wrote upward of 200 biographical sketches, 70-odd sermons, many satires in doggerel, and an immense number of magazine articles. His most famous work, however, is *Three Tours of Dr. Syntax* (1812-21), written in verse, and illustrated by Rowlandson. It is a comic account of the adventures of a pedagogue. Consult Hotten, *The Three Tours*, ed. with a bibliography (London, 1869).

COM'BERMERE, STAPLETON COTTON, Viscount (1773-1865). An English soldier. He was born at Llewenny Hall, Denbighshire, and, after serving in several campaigns in India and South Africa, joined the army in Spain, where he greatly distinguished himself, rising to the command of the entire cavalry of the allied forces. He was commander-in-chief of the army in Ireland from 1822 to 1825, and was then sent in the same capacity to India, where he remained for five years, during part of this time acting as Governor-General. In recognition of his distinguished services, he received the title of viscount, and in 1855 was made field-marshal. A few years after his death, an equestrian statue was erected to his memory at Chester Castle. Consult *Memoirs and Correspondence*, edited by his widow and W. W. Knollys (London, 1886).

COMBES, kônb, FRANÇOIS (1816-90). A French scholar and historian, born at Alby. He became professor of history at the College of Pamiers in 1844, at the Collège Stanislas in Paris, 1848, at the Lycée Bonaparte in 1853, and in the Bordeaux faculty of letters in 1860. He published *Histoire générale de la diplomatie européenne* (1854); *La Russie en face de Constantinople et de l'Europe* (1854); *Histoire des invasions germaniques en France* (1873); *Lectures historiques à la Sorbonne et à l'Institut* (1884-85), and other useful works.

COMBES, JUSTIN LOUIS EMILE (1835—). A French statesman, born at Roquecourbe (Tarn). Educated in a Catholic seminary, he devoted himself to philosophic study, took orders, and in 1860 received the degree of doctor of letters for theses on scholastic metaphysics and on the psychology of Saint Thomas Aquinas. But he suddenly gave up his purpose to become an ecclesiastical professor, studied medicine, took his degree in 1867, and settled at Pons. Eight years later he became mayor of that town. In 1879 he was chosen to the Conseil-Général. Defeated by Jolibois in the elections for 1881, he was elected to the Senate in 1885, soon became a leader of the Democratic Left, and took a special interest in matters of hygiene and education. He was vice-president of the Senate in 1893 and 1894, but resigned from that position in 1895 to accept the Ministry of Education in the Cabinet of Bourgeois, and was viciously attacked by the press and by Waldeck-Rousseau, then more closely allied with the Clerical Party, as a turncoat who used his own ecclesiastical training to help him spy on the Clerical Opposition. But he stayed in the Ministry only a little more than six months, and only showed his readiness for educational reform, with which he had been connected before, as a member of the educational budget of 1891 and 1892, and author of a report on the condition of French schools in Algiers. In June, 1902, Combes took up the difficult task of forming a Ministry to succeed the unusually successful and long-lived cabinet of Waldeck-

Rousseau. But he did not hesitate, even in the task of carrying out to its logical extreme the Association Law of the Waldeck-Rousseau Ministry. By the terms of this law the Premier not alone required the registration of orders, but used the purely optional power of closing minor rural schools. The opposition to this apparent attack on the Church, and evident move against the anti-Republican orders, took the form of armed resistance in some of the outlying districts, especially Finistère; but the Government was firm, and the middle of September saw the excitement abated and the Cabinet secure.

COMBINATION (ML. *combinatio*, from Lat. *combinare*, to combine, from *com-*, together + *bini*, two by two). In law, specifically the union of natural or artificial persons for the promotion of their business interests. When limited to this object, and kept free from fraud, violence, or like sinister methods, it does not fall under the ban of modern law. If it is resorted to, however, for the accomplishment of an unlawful end, it becomes a conspiracy (q.v.), and subjects its promoters to civil actions for damages, as well as to criminal prosecution. Formerly combinations to raise or depress prices, as well as every form of combination in restraint of trade, were treated as conspiracies by English law.

Whether combinations by laborers to raise wages were conspiracies at common law is a question upon which the highest authorities in England differ. If not at common law, they were criminal conspiracies under a series of statutes beginning with 23 Ed. III. in 1349, and closing with 40 Geo. III. c. 60, in 1800. A radical change in legislation on this topic in England began in 1825, and at present combinations of workmen in labor organizations (q.v.) and similar associations are sanctioned by law, both in Great Britain and the United States, provided they are not accompanied by fraudulent, violent, or menacing conduct, or by boycotting or similar unlawful practices. See CONSPIRACY; BOYCOTT; INTIMIDATION; TRADE UNION; STRIKE.

Combinations of skill and capital, within proper bounds, have always received legal recognition; such as the combinations effected in a partnership, joint-stock associations, or corporations. At present the tendency to extend these combinations and to introduce new or modified forms is very marked. Trades unions (q.v.) among workmen, and trusts (q.v.) among capitalists, may serve as illustrations. The legislation relating to these forms of combination, as well as their economic and political bearings, will be dealt with under the appropriate titles.

COMBINATION. See PERMUTATION.

COMBING. See CARDING.

COMBUSTION (Lat. *combustio*, a burning, from *comburere*, to burn, probably for **comurere*, but with *b* inserted on the analogy of *ambustus*, burned; less plausibly for **co-amb-urere*, to burn, from *com-*, together + *amb*, *ambi*, Gk. ἀμφί, *amphi*, around + *urere*, to burn), or BURNING. The process by which bodies combine with oxygen, and are thus seemingly destroyed. The term is, in ordinary parlance, restricted to cases in which the process of combination takes place rapidly and is accompanied by heat and light, as the combustion of wood in a fireplace,

the combustion of a candle, etc. In its more scientific usage, however, the term may designate any possible case of direct combination with oxygen, whether rapid or slow, whether accompanied by light or not. By analogy, the term is also sometimes applied to the rapid union of substances with 'supporters of combustion' other than oxygen, such as chlorine gas, in which a candle may burn almost as well as in air.

The light and heat of combustion are utilized for purposes of every-day life, the combustible material employed, i.e. the illuminant or the fuel, being usually some product containing carbon. Thus ordinary illuminating gas contains a number of gaseous chemical compounds of carbon. Coal and wood are mixtures of carbon compounds, the former containing even a considerable amount of free carbon. Hydrogen, too, is one of the chemical constituents of most fuels and illuminants. When combustion takes place, the carbon and hydrogen, combining with oxygen, give, respectively, carbonic-acid gas (carbon dioxide) and water vapor. These are, therefore, the chief products of ordinary combustion.

The heat produced by the combustion of a given amount of material is independent of the rate at which the combustion takes place, but depends entirely upon the composition and chemical nature of the material burned. Every combustible chemical compound has, therefore, its own definite heat of combustion; that is to say, the number of heat units (say, gram-calories) produced by the combustion of one chemical equivalent (gram-molecule) of a compound, depends upon nothing but the nature of the compound. The following are the heats of combustion of a few well-known compounds of carbon: ordinary alcohol, 340,000 gram-calories; acetic acid (the sour principle of vinegar), 210,000; ethyl-acetic ester, 544,000; cane-sugar, 1,355,000; cellulose, 680,000; urea, 152,000. The combustion of a chemical compound may be conceived as taking place in two consecutive steps: first, the compound is decomposed, i.e. every one of its molecules is broken up into its constituent atoms—a process usually involving not evolution, but *absorption* of heat; secondly, every single atom capable of so doing combines with oxygen (O) an atom of carbon (C), thus yielding a molecule of carbonic acid (CO_2), and two atoms of hydrogen (H) yielding a molecule of water (H_2O). This second step of the process is accompanied by the evolution of a quantity of heat depending upon the number of carbon and hydrogen atoms in a molecule of the combustible compound. But, owing to the absorption taking place during the first part of the process, a portion only of the heat produced during the second part actually appears in the form of sensible heat, and it is that portion which is called the heat of combustion. An exact knowledge of the heats of combustion of various substances is of great importance for theoretical as well as for immediate practical purposes. Its practical importance in comparing, for instance, different kinds of fuel, is self-evident and requires no explanation. Its theoretical importance is mainly in the fact that with the aid of it the exact amount of heat evolved or absorbed during various chemical transformations can be readily calculated. According to the first law of thermodynamics, the amount of heat evolved or absorbed during any transforma-

tion whatever, is independent of the manner in which the transformation takes place. For example, the amount of heat produced by burning one equivalent weight of ordinary alcohol and one equivalent weight of acetic acid, is the same whether we burn them directly or first cause them to combine into ethyl-acetic ester, and then burn the latter. In the second case, the heat absorbed during the formation of the ester must, of course, be combined with that evolved during its combustion. But this suggests a simple way of obtaining the heat of formation of the ester by merely carrying out two combustions. The total heat of combustion of free alcohol and acetic acid is $340,000 + 210,000 = 550,000$ gram-calories (see above); that of ethyl-acetic ester is 554,000 gram-calories. The excess of 4000 gram-calories must therefore represent the amount absorbed during the combination of alcohol and the acid into ethyl-acetic ester. In a similar manner, the heat of any chemical reaction may be determined, if the heats of combustion of the reacting substances and the heats of combustion of the products of the reaction are known. In many cases this is the only certain way of determining with some precision the heat of reactions, as direct measurement during a reaction would often involve very great experimental difficulties, while the direct measurement of the heat of combustion is a comparatively simple matter. The heat of combustion is usually determined by chemists in the following manner: A known amount of the combustible substance is inclosed in an air-tight steel vessel filled with compressed oxygen and lined on the inside with platinum; the vessel is immersed in a calorimeter (see CALORIMETRY), and the substance is ignited with the aid of an iron wire heated by means of an electric current; the observer measures the rise of temperature in the calorimeter, and from this calculates the amount of heat produced. The importance of knowing the heat of chemical reactions is discussed in the article THERMOCHEMISTRY (q.v.).

Now, while the heat of combustion depends only on the chemical nature of the material burned, the rise of temperature caused by it depends to a very great extent on the manner in which the combustion takes place. If other gases, such as the nitrogen of the air, are present without themselves adding to the amount of heat produced, part of that amount goes to heat such gases, and as a result, the temperature is considerably lower than if the same substance were burned in precisely the amount of oxygen gas required for its combustion. The rapidity with which a combustion takes place is another factor on which the temperature depends; for heat may be gradually dissipated by conduction even while it is being produced, and so the actual amount remaining at any moment during a slow process of combustion may be very small. Thus, when phosphorus is exposed to the air at ordinary temperatures, a slow process of oxidation (combustion) takes place, very little heat being given out at any given moment. If ignited in the air, phosphorus burns vividly, giving out much heat and light for a short time. Finally, if ignited in an atmosphere of pure oxygen, it enters into most vivid combustion, evolving, for a very short time, a most intense heat and a brilliant light. An analogous phenomenon may be observed when coal is burned in a furnace. So long as the door of the furnace is open and there is but little

draught through the fuel, the evolution of heat is moderate and may last several hours. But when the door is shut and much air is drawn through the coal, the latter is more quickly burned; the temperature is higher because more heat is evolved during a shorter period of time, but in the long run the amount of heat produced is the same.

Since the process of combustion is a form of chemical transformation more striking and more commonly met with than any other process, it early attracted the attention of scientific observers. But since, on the other hand, it involves the consumption and formation of gases, it baffled their ingenuity for many centuries. Those light, colorless, æriiform substances had, in the first place, to be discovered; and for a long time they escaped the attention of observers, in spite of their being present everywhere and constantly interfering with experimental work. Further, the peculiar properties of gases, together with the striking appearance of flames and fires, gave birth to the erroneous idea that material bodies are capable of losing weight by combining with certain 'principles' and of gaining weight by having such 'principles' taken away from them. Thus the phenomena of combustion long hampered the progress of science. But it was the same phenomena that also finally led to truer conceptions; for their correct interpretation by Lavoisier formed the cornerstone upon which rests the gigantic structure of the chemistry of to-day. See FOOD; FUEL; THERMOCHEMISTRY; CHEMISTRY.

COMÉDIE FRANÇAISE, kô'mâ'dé' frân'sâz' (Fr., French comedy). The official name of the Théâtre Français, the national theatre of France, subsidized by the State for the advancement of dramatic art. Its history dates officially from October 21, 1680, when a decree of Louis XIV. amalgamated the two rival companies of the Hôtel de Bourgogne and the Hôtel Guénégaud, the latter being a fusion, after Molière's death in 1673, of the Théâtre du Marais and the Troupe de Molière. It thus maintains a practically unbroken tradition from the time of the great master of comedy, and is still familiarly known as the House of Molière. In 1682 the King granted to his comedians an annual pension of 12,000 livres (about \$2400), their first subsidy. In 1689 they established themselves in a new house, in what is now called the 'Rue de l'Ancienne Comédie,' and took the name of 'La Comédie Française,' under it they played until the Revolution with a succession of such artists as Baron, Adrienne Lecouvreur, Le Kain, and Mademoiselle Clairon. For a time (1770-82) they were housed in the Palace of the Tuileries itself. Later, on the performance of Chénier's antimonarchical play of *Charles IX.*, in 1789, violent political discussions arose among the performers, and ultimately they split into two sections: the Republican party, under the young tragedian Talma, establishing a new theatre under the name 'Théâtre de la République,' on the site of the present building in the Rue de Richelieu; while the Royalist section took the title 'Théâtre de la Nation.' In September, 1793, the latter was suddenly closed by order of the Committee of Public Safety, and the players imprisoned, though they were afterwards gradually released. For a few years the rivalry continued; then in 1799, for a short time, there was an absolute in-

terruption in the history of the Théâtre Français. In May of that year, however, the Comédie was once more reorganized and settled in the Rue de Richelieu. Napoleon, while at Moscow, October 15, 1812, prescribed the regulations which, modified in 1850 and 1859, still govern the company. There is an *administrateur-général* appointed by the Government. The *sociétaires* are members of the company, who, as shareholders, divide the profits according to certain rules. Before being elected as a *sociétaire*, an artist must have served in the theatre as a *pensionnaire*, upon a salary. A *sociétaire*, after twenty years of service, is allowed to retire with a pension of 4000 francs. The annual sum received from the State is 240,000 francs; and the theatre, being removed from the fear of temporary pecuniary failure, is in no sense a mere business speculation, but serves as an educator of public taste and sets a standard of dramatic training. Here many of the greatest artists of the modern French stage have won their triumphs, including Milles, Mars, Rachel, Brohan, and, for a part of her career, Sarah Bernhardt, and MM. Talma, Got, Mounet-Sully, and Coquelin. Early in 1900 the historic building adjoining the Palais Royal was partly destroyed by a disastrous fire, but was promptly rebuilt in improved fashion within the same lines. Consult: Matthews, *The Theatres of Paris* (New York, 1880); Lucas, *Histoire philosophique et littéraire du Théâtre-Français* (Paris, 1862-63); Bonnassies, *La Comédie Française, histoire administrative* (Paris, 1874); Joannides, *La Comédie Française de 1680 à 1900, dictionnaire général des pièces et des auteurs*, preface by Jules Claretie (Paris, 1901); Cochran, *The Théâtre Français in the Reign of Louis XV.* (London, 1879); and, for a discussion of many of the plays of its recent repertory, Weiss, *Autour de la Comédie Française* (Paris, 1892).

COMÉDIE HUMAINE, ŷ'mân' (Fr., human comedy). A series of novels by Honoré de Balzac, the first volume of which was published in 1829, but the general title of which was not announced until 1842. Its plan was to present a panorama of the entire life of his country and time. This colossal attempt was left incomplete on his death in 1850. But well nigh a hundred novels remain, dealing with innumerable types and situations characteristic of the France of the early nineteenth century.

COMEDY. See DRAMA.

COMEDY OF ERRORS, THE. An early play of Shakespeare, acted at Gray's Inn, December 28, 1594, and printed in 1623. It was probably suggested by the *Menæchmi* of Plautus. The plot revolves around the amusing blunders caused by the complete similarity, in person, of the twin brothers, Antipholus of Syracuse and Antipholus of Ephesus, and their twin servants, the Dromios, whom even their masters are not able to tell apart.

COMELY BANK. A suburban street leading out of Edinburgh, from the northwest of the town. Thomas Carlyle lived there at the time of his visit to Jeffrey.

COME'NIUS, or KOMENSKY, JOHANN AMOS (1592-1670). A noted educational reformer of the seventeenth century, born either at or near Ungarisch-Brod, Moravia. His parents belonged to the Moravian Brethren, and Comenius became

one of the leaders of that sect. Though on account of poverty he was unable to begin his education until late—he did not enter the Latin school at Strassnick until he was sixteen—he attended the gymnasium of Herbörn, in Nassau, and later studied at Heidelberg. In the course of his study he became acquainted with the educational reforms of Ratichius (q.v.), and with the report of these reforms issued by the universities of Jena and Giessen.

The work of Comenius included three important fields of activity. His practical work, constituting throughout his life his most immediate concern, was that connected with the Moravian Church. In 1614 he was ordained to its ministry, and four years later was given the charge at Fulnek, one of the most flourishing churches of that communion. In consequence of the religious wars he lost all his property and his writings in 1621, and six years later was compelled to flee from his native country on account of the proscription of all Protestants. Settling at Lissa, in Poland, he became director of the gymnasium there and was given charge of the Bohemian and Moravian churches. In 1641 he went to England to join a commission charged with the reform of the system of public education, but the disturbed political condition of the country interfered with his project. In the following year, at the invitation of Oxenstiern, he applied himself to the task of reorganizing the Swedish schools. He elaborated his plans at Elbing, West Prussia, where he settled in 1642. In 1648 he was elected Bishop of the Moravian Brethren at Lissa, which town he made once more his residence, and where he published a number of his philological works. He subsequently visited Transylvania, and in 1650 assisted in drawing up a plan for reforming the Protestant school of Sáros-Patak, Hungary. In 1654 he returned to Lissa; but in the war which soon after raged in Poland he once more lost all his property, including his manuscripts, and was compelled to flee (1657). He traveled through Silesia and Brandenburg, visited Stettin and Hamburg, and finally settled at Amsterdam, where he died.

Through all his wanderings and all his educational activities, Comenius's religious interests were cared for to the neglect of many of his great educational plans. The somewhat mystical bent of his mind, however, led the gifted reformer into extremes that render much of his writings valueless for modern times, and in his last years made him an easy dupe of religious impostors.

His second great interest was in furthering the Baconian attempt at the organization of all human knowledge. He became one of the leaders in the encyclopædic or pansophic movement of the seventeenth century, and, in fact, was inclined to sacrifice his more practical educational interests and opportunities for these more imposing but somewhat visionary projects. The men of affairs who aided him with funds and gave him protection and opportunity for continuing his educational investigations and writings were more interested in their immediate practical import, and insisted, in spite of the wishes of Comenius, on his devoting his energies and original insight to the work of organizing schools, and writing text-books or works on method. In 1639 Comenius had published his *Pansophia Prodomus*, and in the following year his English friend Hartlib published, without

his consent, the plan of the pansophic work as outlined by Comenius. The result of his life's work in this sphere, his *Pansophia*, was destroyed in manuscript in the burning of his home in Lissa in 1657. The pansophic ideas find partial expression in the series of text-books produced from time to time. In these he attempts to organize the entire field of human knowledge so as to bring it, in outline, within the grasp of every child.

The most permanent influence exerted by Comenius was in the practical educational work. Few men since his day have had a greater influence, though for the greater part of the eighteenth century and the early part of the nineteenth there was little recognition of his relationship to the current advance in educational thought and practice. The practical educational influence of Comenius was threefold. He was first a teacher and an organizer of schools, not only among his own people, but later in Sweden, and to a slight extent in Holland. In his *Great Didactic* he outlines a system of schools that is the exact counterpart of the existing American system of kindergarten, elementary school, secondary school, college, and university. In the second place, the influence of Comenius was in formulating the general theory of education. In this respect he is the forerunner of Rousseau, Pestalozzi, Froebel, etc., and is the first to formulate that idea of 'education according to nature' so influential during the latter part of the eighteenth and early part of the nineteenth century. The influence of Comenius on educational thought is comparable with that of his contemporaries, Bacon and Descartes, on science and philosophy. In fact, he was largely influenced by the thought of these two; and his importance is largely due to the fact that he first applied or attempted to apply in a systematic manner the principles of thought and of investigation, newly formulated by those philosophers, to the organization of education in all its aspects. The summary of this attempt is given in the *Didactica Magna*, completed about 1631, though not published until several years later. The third aspect of his educational influence was that on the subject matter and method of education, exerted through a series of text-books of an entirely new nature. The first-published of these was the *Janua Linguarum Reserata* (The Gate of Languages Unlocked), issued in 1631. This was followed later by a more elementary text, the *Vestibulum*, and a more advanced one, the *Atrium*, and other texts. In 1657 was published the *Orbis Sensualium Pictus*, probably the most renowned and most widely circulated of school text-books. It was also the first successful application of illustrations to the work of teaching, though not, as often stated, the first illustrated book for children.

These texts were all based on the same fundamental ideas: (1) learning foreign languages through the vernacular; (2) obtaining ideas through objects rather than words; (3) starting with objects most familiar to the child to introduce him to both the new language and the more remote world of objects; (4) giving the child a comprehensive knowledge of his environment, physical and social, as well as instruction in religious, moral, and classical subjects; (5) making this acquisition of a compendium of

knowledge a pleasure rather than a task; and (6) making instruction universal. While the formulation of many of these ideas is open to criticism from more recent points of view, and while the naturalistic conception of education is one based on crude analogies, the importance of the Comenian influence in education has now been recognized for half a century. The educational writings of Comenius comprise more than forty titles. In 1892 the three-hundredth anniversary of Comenius was very generally celebrated by educators, and at that time the Comenian Society for the study and publication of his works was formed. Consult: Laurie, *John Amos Comenius, Bishop of the Moravians: His Life and Educational Works* (London, 1884); Quick, *Essays on Educational Reformers* (London, 1868); Raumer, *Geschichte der Pädagogik*, vols. i.-iv. (Gütersloh, 1874-80); Müller, *Comenius, ein Systematiker in der Pädagogik* (Dresden, 1887); Löscher, *Comenius, der Pädagog und Bischof* (Leipzig, 1889).

COMET (AS., Lat. *cometa*, comet, from Gk. *κομήτης*, *komētēs*, having long hair, from *κομᾶν*, *komān*, to wear long hair, from *κόμη*, *komē*, hair). The word 'comet' had its origin in the hairy appearance often exhibited by the haze or luminous vapors, the presence of which is at first sight the most striking characteristic of the celestial bodies called by this name. The general features of a comet are: a definite point or nucleus, a nebulous light surrounding the nucleus, and a luminous train preceding or following it. Anciently, when a train preceded the nucleus—as is the case when a comet has passed its perihelion and recedes from the sun—it was called 'the beard,' being termed 'the tail' when seen following the nucleus as the sun is approached. This distinction has disappeared from all modern astronomical works, and the latter name is given to the appendage, whatever its apparent position. Neither this luminous attendant, the tail, nor the nucleus, is now considered an essential cometary element, but all bodies in the solar system are classed as comets if they have a motion of their own, and describe orbits of an extremely elongated form. There are several plain points of difference between comets and planets. The planets move in the same direction, from west to east, which is astronomically called 'direct motion;' but the movements of comets are often from east to west, or retrograde. The orbits of all the planets are confined to a zone of no great breadth on either side of the ecliptic; but the paths of comets cut the ecliptic in every direction, some being almost perpendicular to it. The orbits of all the planets are nearly circular; or, more properly speaking, are ellipses of very small eccentricity. The orbits of comets, on the other hand, present great variety of eccentricity, many of them being ellipses or elongated closed orbits of various degrees of elongation; others, though very rarely, may be hyperbolas; while the majority have a form of orbit not differing sensibly from the parabola, which is the limiting form of curve to which both the ellipse and hyperbola usually approximate. Any attraction, however, of an extraneous body, like a planet, interfering with the attraction of the sun, might change the orbit from the ellipse to the hyperbola, and vice versa, or from the parabola to either. As, however, there is only one parabola

corresponding to infinite sets of ellipses and hyperbolas, an interfering cause is not likely to change the orbit from an ellipse or hyperbola to the parabolic form. Of about 350 comets whose orbits have been obtained with more or less accuracy, 60 appear to have described ellipses, 275 orbits cannot be distinguished from parabolas, and in two cases the hyperbolic form of orbit is extremely probable. The discovery that comets are celestial bodies extraneous to our atmosphere is due to Tycho Brahe, who ascertained the fact by observations of the comet of 1577. Newton succeeded in demonstrating that their movements are subject to the same law which controls the planets in their orbits. Halley was the first, by determining the parabolic elements of a number of comets from recorded observations, to identify the comets of 1682 with one which had been observed in 1607 and with one observed by Apian at Ingolstadt in 1531, and thus confidently to predict the return, at the end of 1758 or the beginning of 1759, of a comet which would have the same parabolic elements. This prediction of the first 'periodic' comet moving in a closed oval orbit simply meant that the portion of the closed orbit lying nearest the sun, and therefore the only observable portion of the orbit, would very closely resemble the parabolas or open curves in which this comet had been supposed to be moving at its earlier appearances.

Parabolic cometary elements are the following: (1) The inclination; (2) the longitude of the node; (3) the longitude of the perihelion or point of nearest approach of the sun; (4) the perihelion distance, or nearness of approach to the sun; (5) the direction of motion, whether direct or retrograde. The first two of these elements determine the plane of the orbit. To determine these parabolic elements, three observations of the comet are sufficient; and by a table of such elements, calculated from recorded observations, it is possible at once to ascertain, as Halley did, whether any newly observed comet is identical with any that has been previously observed. However, to predict with accuracy the time of the return of a comet, a much more accurate calculation must be made of the orbit, taking into account the perturbations of the planets to whose influence it is subject. This difficult problem was solved, in the case of Halley's comet, by the joint work of Lalande, Mme. Lepaute, and Clairaut, who announced in November, 1758, just as astronomers began to look out for the return of the comet, that it would take 618 days more to return to the perihelion than on the preceding revolution. The perihelion passage was fixed about the middle of April, 1759; but Clairaut distinctly stated that, being pressed for time, he had neglected small values which collectively might amount to about a month in the seventy-six years. The comet passed the perihelion on March 12, 1759, exactly a month before the time announced, but within the assigned limits of divergence from that date. The elements of its orbit proclaimed it to be the comet of the former appearances by their similarity. For the next perihelion passage, the different calculations executed by Damoiseau and De Pontécoulant fixed the 4th, the 7th, and the 13th of November, 1835. Subsequently, observations indicated the 16th—that is to say, a deviation of only three days from

what turned out the most accurate calculation, and a deviation of twelve days from the most remote. We have adverted to the perihelion passages of this comet in 1531, 1607, 1682, 1759, and 1835. It is also now identified with a comet observed in 1456, and one in 1378, recorded by Chinese observations. There are no sufficiently reliable European observations previous to 1456, but it is conjectured that this comet is the same with the comet of 1501, with that of 1145, with a comet mentioned in 1066 by Hali ben Rodoan, with that of 989, and finally, with a comet seen in the year 12 before our era. This account of Halley's comet has been given at length, to illustrate the principles on which the calculations are made. There are, in all, eighteen comets whose periodicity is established by the fact that their return has been actually observed: (1) That of Encke, with a short period of 3.303 years; its orbit does not extend so far as the orbit of Jupiter, and a slight acceleration in its periodic times of return has suggested the possibility of space, within our solar system at least, being occupied by a resisting medium, though of extreme rarity. (2) That of Biela or Gambart, having a period of 6.692 years. During the visit of this comet in 1846, it was seen to separate into two distinct parts, which kept moving side by side till they disappeared. On the return of the comet in the autumn of 1852, the distance between the two nuclei had much increased. Since then, although many times due, it has not again been seen. (3) That of Faye, with a period of 7.566 years. The orbits of Biela's and Faye's comets extend beyond the orbit of Jupiter, but not so far as that of Saturn. (4) That of Winnecke, with a period of 5.831 years. (5) That of Brorsen, with a period of 5.456 years. (6) That of Temple (No. 1), with a period of 6.538 years. (7) That of Temple (No. 2), with a period of 5.281 years. (8) That of D'Arrest, with a period of 6.675 years. (9) That of Tuttle, with a period of 13.667 years. (10) That of Swift, with a period of 5.547 years. (11) That of E. Swift, with a period of 5.863 years. (12) That of Finlay, with a period of 6.556 years. (13) That of Wolf, with a period of 6.845 years. (14) That of Holmes, with a period of 6.874 years. (15) That of Brooks, with a period of 7.097 years. (16) That of Pons, with a period of 71.56 years. (17) That of Olbers, with a period of 72.65 years. (18) That of Halley, with a period of 76.08 years. The orbits of sixty comets appear to be ellipses. These are *probably* periodical. The paths of about two hundred cannot be distinguished from parabolas. These are *possibly* periodical, as the ellipse, when very eccentric, cannot near perihelion be distinguished from a parabola. Only about a dozen have orbits possibly hyperbolic; and, as we have said, in only two cases is the hyperbolic character of the path established upon fairly reliable evidence.

In the month of June, 1770, Messier discovered a comet which remained visible a long time, and enabled Lexell to ascertain the orbit to be an ellipse whose major axis was only three times the diameter of the earth's orbit, and corresponded to a periodic revolution of five and one-half years. This result suggested grave difficulties. It had been found impossible to identify this comet with any previously observed, and yet it was difficult to conceive that a bright

comet with so short a period of return should have previously escaped observation. What was still more remarkable, it was never seen again, though anxiously looked for in the places where Lexell's orbit would have brought it. It became popularly called 'Lexell's lost comet,' and gave occasion to many sarcasms by the wits of the day at the expense of astronomers, who had boasted of having found the key to the cometary movements. In the present day the explanation is complete. The comet was never seen before 1770, because its orbit previously had been totally different, its nearest point to the sun having been as distant as the path of Jupiter. Its appearance that year arose out of the fact that in 1767 it was in such close contact with Jupiter, moving in the same direction and nearly in the same plane, that the attraction of that planet entirely changed its orbit. But why has the comet not since been seen? Its passage to the point of perihelion in 1776 took place by day; and in 1779, before another return, it again encountered the vast body of Jupiter, and suffered a fresh orbital derangement—the attraction of the planet deflecting it into more distant regions, and so changing the form of the orbit that if it had again been visible, it would probably not have been recognized as identical with Lexell's comet.

The celebrated comet of 1680, which furnished Newton with the occasion for proving that comets revolve around the sun in conic sections, and that, consequently, they are retained in their orbits by the same force as that which regulates the movements of the planets, appears to have been about the most remarkable for brilliancy of any of which we have authentic accounts. This comet is supposed to be identical with the one that appeared about the time of Caesar's death (B.C. 44), with that which was seen in the reign of Justinian in the year 531, and with another in the year 1106, in the reign of Henry II.; the period of revolution, according to the orbit calculated for it by Whiston, being about 575 years. There is, however, some doubt among astronomers as to the real form of its orbit, the one assigned to it by Encke giving it a period of 8.813 years. The tail of a comet is nearly always away from the sun, frequently assuming a curved form. It increases in length with its proximity to the sun, but does not acquire its greatest length till after passing the perihelion. These are usual characteristics of comets, which were exemplified by this one in a remarkable degree. The phenomena might be accounted for, if we were to regard the train as vaporization produced by the intense heat to which the body of the comet is exposed in its approach to the sun. In the nineteenth century the comets most remarkable for brilliancy were the comets of 1811, 1843, 1858 (Donati's), 1861, 1880, 1881, and the great comet (b) of 1882. Spectroscopic investigation, so far as yet pursued, points to the conclusion that comets are self-luminous, and do not shine merely by reflecting solar light. It has been discovered, in determining the tracks of those streams of dark bodies that cause meteoric showers, that some of the tracks coincide with the orbits of well-known comets. From this it is inferred that star-showers and comets may be only different manifestations of the same thing. (See METEORS.) What the matter of the comets consists of is, of course, only a subject for

speculation. The composition of the nebulosity and the tail is, at all events, something of almost inconceivable tenuity, as shown by three considerations. (1) Stars seen through them suffer no diminution of brightness, though the light must have to traverse sometimes millions of miles of the cometary atmosphere. (2) Though the thickness of the tail of a comet may be millions of miles, and its length of course much greater, the comets have never been observed to cause any sensible disturbance of the planetary motions, though approaching near enough to be themselves so much affected as to change the entire character of the orbit. (3) The curvature of the tails, and the acceleration of the periodic time in the case of Eneke's comet, indicate the possibility of their being affected by a resisting medium, which has never been observed to have the slightest influence on the planetary periods, though so long observed. Even the nuclei of comets appear to be of extremely small density. This may be inferred, though with less force than regards the tails, from the two last considerations above mentioned; and, moreover, there are reliable accounts of stars of a very low order of magnitude being seen through the nuclei themselves.

Comets have been alternately regarded with terror and with welcome in the popular mind. The appearance of Halley's comet in 1456, just as the Turks had become masters of Constantinople, and threatened an advance into Europe, was regarded by Christendom with a superstitious dread, and to the Ave Maria was added the prayer: "Lord, save us from the devil, the Turk, and the comet." At Constantinople, the occurrence of a lunar eclipse at the same time, increased the portentousness of the event. The discoveries of science as to the magnitude of the space filled by their bodies and their prodigious velocity, together with the confessed impossibility of always predicting their approach, produced fears of another kind, which have sometimes been, especially in France, extravagantly exaggerated in the public mind. The groundlessness of such alarms, from the extreme improbability of collision with the nucleus, the probable innocuousness of a contact with the extremely attenuated surrounding matter, and, possibly, to the greater part of the world, of a collision with the nucleus itself, will be sufficiently evident from what has been said above. It is probable that already on many occasions some of the attenuated vapor in the tail of comets must have come within the earth's attraction, and been absorbed in its atmosphere. Whether the effect is deleterious or salubrious, or whether it has any perceptible influence at all, is only matter of speculation. The salubrity of cometary influence was at one time a popular idea; and the vintages of 1811 and 1858 were favorable seasons, whose produce was formerly advertised as the comet wines. It is scarcely worth while, however, to follow further speculation on these subjects. Consult: Guillemin, *The World of Comets*, trans. by Glaisher (London, 1881); Zöllner, *Ueber die Natur der Kometen* (Leipzig, 1883); Marcuse, *Ueber die physische Beschaffenheit der Kometen* (Berlin, 1884); Ball, *In the Starry Realm* (London, 1892); Galle, *Verzeichniss der Elemente der bisher berechneten Kometenbahnen bis zum Jahre 1894*

(Leipzig, 1894); Lynn, *Remarkable Comets* (London, 1899).

COMET-SEEKER. A telescope having a wide field of view, but a rather low magnifying power, used in searching for comets.

COMFORT, kŭm'fĕrt, GEORGE FISK (1833—). An American educator. He was born at Berkshire, N. Y., and graduated at Wesleyan University in 1857. He was one of the leaders in organizing the American Philological Association (1869), and also in establishing the Metropolitan Museum of Art in New York City (1869-72). From 1872 to 1887 he was professor of modern languages and aesthetics in Syracuse University, and in 1872 founded there the College of Fine Arts, of which he was dean from 1873 until 1893. In the latter year he became president of the Southern College of Fine Arts, at La Porte, Tex., and in 1896 organized the Syracuse Museum of Fine Arts, of which he became the director. He has published: *Art Museums in America* (1869); *Modern Languages in Education* (1870); *Woman's Education and Woman's Health* (1894); *The Land Troubles in Ireland* (1898); and a series of German text-books.

CONFREY, kŭm'frĭ (OF. *eumfrie*, *confire*, from ML. *confirma*, probably on account of its strengthening powers, from Lat. *confirmare*, to make firm, strengthen, from *con*, together + *firmare*, to strengthen, from *firmus*, firm), *Symphytum*. A genus of plants of the natural order Boraginaceæ. The species, which are not numerous, are natives of Europe and the north of Asia. They are perennial plants of coarse appearance, although occasionally to be seen in flower borders. *Symphytum officinale* (the common confrey) and *Symphytum tuberosum* are natives of Great Britain, frequent in shady and moist places. *Symphytum officinale* was formerly much esteemed as a vulnerary, on account of its astringency, and decoctions of its roots were a household remedy for diarrhœa. Its young leaves and its blanched shoots are also occasionally used as boiled vegetables. The prickly confrey (*Symphytum asperinum*), a native of Caucasus, 6 to 10 feet in height, has been highly recommended for feeding cattle. It has been extensively tried in the United States, but its cultivation is not recommended, except when a large bulk of forage is required from a limited area of rich land. It is propagated from roots.

COMICAL GALLANT, THE, OR THE AMOURS OF SIR JOHN FAUSTAFF. An adaptation, by John Dennis (1702), of Shakespeare's *Merry Wives of Windsor*.

COMICAL LOVERS, THE, OR MARRIAGE À LA MODE. A comedy by Colley Cibber (1707), based on portions of Dryden's *Secret Love* and *Marriage à la Mode*.

COMICAL REVENGE, THE, OR LOVE IN A TUB. A comedy by Sir George Etherege, played and printed in 1664.

COMINES, kŏ'mĕn' (Lat. *Cominæus*, Flemish *Comen*). A border town of France and Belgium, situated on the Lys, by which it is divided into two parts, one belonging to the French Department of Nord and the other to the Belgian Province of West Flanders. It has a number of textile-mills and tobacco-factories. The celebrated

medieval chronicler, Philippe de Comines, was born here. Population, French portion, in 1901, 8129; Belgian, in 1899, 5757.

COMINES, PHILIPPE DE (1445-1509). A French statesman and historian. He was born at the Castle of Comines, not far from Lille; received a careful education, and in 1464 attached himself to Charles the Bold of Burgundy (then Count of Charolais). In 1472 Comines entered the service of Louis XI., the rival and enemy of Charles, who made him one of his confidential advisers. He proved himself a very suitable agent for carrying out the designs of the crafty monarch; but after the death of Louis he incurred the displeasure of the regent, Anne de Beaujeu, by his adherence to the party of the Duke of Orléans (afterwards Louis XII.), and was sentenced to the forfeiture of a fourth of his estates and to ten years' banishment. This punishment, however, does not seem to have been carried out, for after a few years we find Comines again employed in important affairs of diplomacy; but though he was engaged in the service of Charles VIII. and the Duke of Orléans, he failed to win the confidence of these masters. He died at his Castle of Argenton, October 13, 1509. Comines's *Mémoires*, which are a complete survey of the political history of his time, and depict vividly the character of Louis XI., are admirably written, and afford abundant proof of an acute and vigorous mind. He seems to have looked keenly into the heart of every man who crossed him in life, and with cool and severe precision to have dissected him for the benefit of posterity. Among the many editions of his *Mémoires*, the best are those by Lenglet-Dufresnoy (4 vols., London, 1747); by Mademoiselle Dupont (3 vols.), in the *Collection de la société de l'histoire de France* (Paris, 1840-47); and by Chantelange (Paris, 1881).

COMISCO, kō-mě'sō. A city in Sicily, in the Province of Syracuse, situated about 40 miles southwest of the city of that name. It was known in Roman mythology as the location of a fabled fountain of Diana, the water of which, when drawn by women of light character, refused to mingle with wine. It is on the road between Catania and Licata, and has two churches, a theatre, and cotton and soap factories. Population (commune), in 1881, 19,333; in 1901, 21,873.

COMITÁN', kō-mě-tān', or **COMITLÁN**. A town in the State of Chiapas, Mexico, situated on the Grijalva River, about 30 miles southeast of San Cristóbal (Map: Mexico, N 9). It has a fine Dominican cloister. The town is largely engaged in agriculture and cattle-raising, but has manufactures of cotton and woolen goods, liquors, etc., and carries on a contraband trade with Guatemala and British Honduras. Comitán suffered considerably from the raids of Juan Ortega in 1855-64. Population, about 10,000.

COMITIA, kō-mish'ī-ā (Lat. nom. pl., assemblies from *com-* (*con-*), together + *ire*, to go). The legal or constitutional meetings of the Roman people, convoked by a magistrate, for the purpose of putting a question to the vote. This definition comprehends at least all the comitia except the *Comitia Calata*, where the people were present merely as spectators. There were several kinds of comitia, held for different purposes, and, according to the mode of constituting

the comitia, the preponderance lay with the patricians or with the plebeians. It was always a fundamental principle of the Roman Constitution that the supreme power was inherent in the citizens, though it might be delegated by them to hereditary or to elected magistrates. All important matters, however, had to be brought before the sovereign people, who could either ratify or reject, though without discussion, the proposals made to them. Such, at least in theory—and, during the best days of the Republic, in practice also—was the function of these popular assemblies. As may be readily understood, different elements had the ascendancy among the Roman people at different periods of their history. So far as it was possible for a State exposed to so many and such various influences to be conservative of its political traditions, Rome, whether monarchical, republican, or imperial, was essentially so. But, under the force of circumstances, from time to time innovations were introduced which very materially altered the position of the two political parties—the patricians and the plebeians—into which the State was early divided, and by whose dissensions it was long distracted, and in none of her institutions can the progress of the struggle between these rising factions be more clearly traced than in the motive and power of those assemblies, or comitia, by which the supreme authority of Rome was in succession wielded. It is usual to describe the Roman comitia as of three kinds, named from the mode in which the people were organized and in which they voted—the *Comitia Curiata*, or assembly of the curiæ; the *Comitia Centuriata*, or assembly of the centuries; and the *Comitia Tributa*, or assembly of the tribes. To these some add a fourth, the *Comitia Calata* (from *calare*, to call); but as this assembly had neither political functions nor a separate organization, it is unnecessary to do more than mention the name.

(1) **COMITIA CURIATA**. The assembly of the curiæ is believed to have been coeval with the rise of Rome itself, and its origin is therefore rightly ascribed by tradition to the mythical founder of the city. The system seems to have been an essential part of the communities, of which Rome was originally only one. Its primary object cannot now be satisfactorily determined; but the purpose for which it came to be employed is sufficiently clear. From a very early period the Roman curiæ, or 'wardships,' as they may be called, numbered thirty, being ten for each of the three once independent communities—the Ramnes, the Tities, and the Luceres—from whose amalgamation the Roman people sprang. At first, these curiæ were probably made up extensively of the freeholders, or patricians, as the freeholders were afterwards designated, on whom devolved exclusively the right and the duty of bearing arms. It has been maintained by some that the class of dependents called by the Roman writers clients, as well as the burgesses or citizens, had a right to vote in the assembly of the curiæ. No direct evidence, however, can be brought forward in support of this supposition, which, in the nature of the case, is highly improbable; and, if allowed to be present at all, they were very likely nothing more than spectators, or, as their name is said to imply, 'listeners.' In an assembly each curia had one vote, and determination was by the ma-

jority of the individual voters in the different curiæ. As the number of the curiæ was even, and no provision was made for deciding in case of there being an equal division on any question, it would seem as if this function had not been thought of in fixing the number of the curiæ, or had been subordinated to some other consideration. The purely political importance of the Comititia Curiata declined after the political distinctions between patricians and plebeians terminated. It retained, however, to a late period its original powers as to the transference of a patrician to the plebeian order and the admission of non-patricians to patrician standing.

(2) COMITIA CENTURIATA. By the operation of obvious causes, a great increase soon took place in the number and influence of the dependent members of the Roman Commonwealth. As a natural consequence, the way was paved for a reform of the Constitution, though we may well conceive that the step was hastened by the gradual thinning of the ranks of the old freeholders in the incessant wars in which Rome found herself involved with her neighbors. Thus, in the course of time a new class, the plebeians of history, arose out of the clients, preponderating in numbers, and by no means destitute of wealth. Though this class had not, perhaps, the rights of citizens, it was exempt from service in the field; and while the political inferiority of its members must have been galling, their immunity from the chances of war can hardly have been looked upon with equanimity by the ruling faction. It was to redress this twofold grievance that the reform ascribed to King Servius Tullius is generally believed to have been effected. But the whole scheme was one skillfully devised to assign duties to the plebeians rather than to bestow upon them rights, and it was evidently the work of a statesman who was in the interest of the patricians. The chief authorities for the details of the arrangement are Livy and Dionysius, whose accounts, though they differ in some particulars, agree in the main. We must bear in mind, however, that both of them describe the assembly of the centuries rather as it existed in their own day than as it was first constituted. Livy gives the whole number of the centuries as 194; Dionysius makes them 193. The voting of the assembly was by centuries, each possessing a collective vote exactly as in the case of the curiæ. It was so arranged that the eighteen centuries of *equites* and the eighty centuries of the first class voted first. If they were agreed upon a question at issue, the other side were not called upon to vote at all. As the centuries, though nominally 'hundreds,' probably contained in the first class fewer, and in some of the other classes certainly many times more than that number, it is plain that in the assembly by far the largest share of power was retained in the hands of the wealthy, of whom the original burghess element would long form the main portion. How far we have in this scheme merely a modification of an earlier arrangement, there are no means of determining. As Mommsen remarks, it is more than probable that the original assessments were laid upon land. Be this as it may, the reform of Servius was originally a new military rather than a new political organization, its author intending that the privileges of the patricians assembled in the curiæ should remain as before.

But its results were different from what had been anticipated. By a process easily understood, the rights of the curiæ gradually passed to the centuries. The assembly of the former continued, indeed, to meet; but the assembly of the latter became thenceforth the chief guardian of the rights of the Roman people.

(3) COMITIA TRIBUTA. The further development of the democratic element in the Roman Constitution, consequent on the change just described, soon led to a demand for greater changes in the same direction. The tribunes of the people, now the acknowledged leaders of the democracy, took advantage of an ancient division of the original territory of Rome into tribes to give greater prominence to this element than it had yet possessed. These tribes, thirty, and afterwards thirty-five, in number, which, as is supposed by some, had already supplied a basis for the arrangement into curiæ as well as classes, seem to have at first existed for purely local purposes. But the leaders of the people succeeded at length in forming them into a political union entitled to exercise certain functions, chief among which was the election of the inferior magistrates, and the approval and rejection of such legislative measures as affected the interests of the plebeians as a class. Whether the assembly of the tribes was composed only of plebeians, or of all, whether patrician or plebeian, living within certain limits, has not been ascertained; but the balance of opinion inclines to the hypothesis that it consisted of plebeians alone. After the rise of this new power, it became a matter of great difficulty to determine what questions were to be submitted to the tribes, and what to the centuries, each claiming to be the real representatives of the whole body of the people. A solution appears to have been sought and found in some combination of the two rival assemblies. At what time this change took place, and what was its exact nature, are matters which remain involved in the greatest obscurity. All that can be said is this: The plebeians, either by means of their own assembly, or by some use of it to counterbalance the power of the patricians in the assembly of the centuries, ultimately gained what they had so long aimed at—a position of supreme importance to the Republic. When the wealthier classes found their influence thus neutralized, they ceased to attend the comitia altogether, and the popular will was represented by the lower classes alone. A period of moral and political corruption followed, ending in the military despotism of the Cæsars. Under the first emperors the form of calling the assemblies together was still observed; but the people met no longer to control their chief ruler, but simply to receive information as to what he had done. Even this form was by and by discontinued, and in the last days of the Empire the comitia was an institution known only as one of the traditions of the past greatness of Rome. Consult Mommsen, *Römische Forschungen*, vol. i.; and see **ROME**.

COMITIUM (Lat., place of assembly). A small square in ancient Rome, between the Forum and the Senate House. It was originally the polling-place of Rome, where the Comititia Curiata met and important cases were tried. It contained the old rostra, and near by was the Græcostasis, or platform for foreign ambassadors. On it stood a number of statues, includ-

ing those of the Augur Attus Navius, Pythagoras, Alcibiades, and Horatius Cocles; the Ficus Ruminalis; and a bronze statue of the she-wolf suckling Romulus and Remus. Wooden furniture was provided when needed on special occasions, and furnished the fuel for the conflagration which destroyed the neighboring curia at the burial of Clodius.

COMITY OF NATIONS. That species of international legal courtesy by which the laws and institutions of one country are recognized and given effect to by those of another. It is often called by its Latin equivalent, *comitas gentium*. "In the silence of any positive rule," says Mr. Justice Story, "affirming, or denying, or restraining, the operation of foreign laws, courts of justice presume the tacit adoption of them by their own government, unless they are repugnant to its policy or prejudicial to its interests." From the existence of so great a number of independent States on the Continent of Europe, and of federated States in America, the *comitas gentium* is more called into play in these countries than in England, and it has consequently been more extensively discussed by their legal writers. See CONFLICT OF LAW; INTERNATIONAL LAW; and the authorities there referred to.

COMMA (Lat., Gk. *κόμμα*, *komma*, clause, piece, from *κόπτειν*, *koptein*, to strike). In the mathematical study of sound, in which tones are expressed in exact values by means of their vibration numbers, we find that by reckoning upward in two different ways to a certain note, the two results show an infinitesimal difference in pitch. This minute interval, called a comma, is only perceptible in theory, and has no actual musical value in our modern 'tempered' scale. By tuning upward four perfect fifths from a given note, and then two octaves and a major third from the same note, we reach apparently the same tone; but, calculating the vibrations, we find the first result exceeds the second in the proportion of 81 to 80. This difference is called the comma *syntonum*, or comma of Didymus. The difference obtained by tuning upward twelve fifths and seven octaves from a given tone is $\frac{531441}{521280}$, and is called the comma *ditonicum*, or comma of Pythagoras. These same figures result as the difference between six whole tones above a note and its octave.

COMMA BACILLUS. See CHOLERA.

COMMA BUTTERFLY. A North American nymphaline butterfly (*Grapta*, or *Polygonia comma*), one of the angle-wings, reddish-brown with darker spottings, and a light mark, shaped like a comma, on the hinder wing. It is widely distributed and common, feeding upon nettles, and is injurious to hops. See HOP-INSECTS.

COMMANDANT' (Fr. *commandant*, pres. part. of *commander*, to command, ML. *commandare*, to command, from Lat. *com-*, together + *mandare*, to enjoin). A relative title, incident to a military command, and applied to the commander of a garrison, fortified post, or military school, without any regard to his absolute rank. The Cavalry School at Fort Riley, Kan.; the Artillery School at Fort Monroe, Va.; the United States Military Academy at West Point; Sandhurst, Hythe, and Kneller Hall, England, are all governed by officers of varying ranks, holding the local title of commandant.

In the United States Navy the title of commandant is applied to the commanding officer of a navy-yard or naval station. The commandants of the principal navy-yards are line officers of the rank of rear-admiral; lesser stations are commanded by captains or officers of less rank. To the commandant is given full jurisdiction over all vessels lying at the yard, and he is responsible for all building and repair work. He is also responsible for the proper organization of the working forces; for the effective organization of the yard force for protection against fire; and for the care and management of all machinery, equipment, etc., under his control. He is assisted by an officer of the rank of captain, or of less rank when the commandant is not a rear-admiral, who acts as his executive officer and is called the *captain of the yard*. *Master-Commandant* was formerly the title of officers in the United States Navy next junior in rank to captains. In 1838 Congress enacted that *master-commandants* should thereafter be known as and styled *commanders* (see COMMANDER); the latter title had previously been recognized in the pay bill of March 3, 1835. The title of master-commandant was a relic of the days of transition from the time when the fighting on board ships was done by soldiers commanded by an officer of the land forces to that when the fighting and navigating forces were combined. The titles of *sailing-master*, *master*, *master's mate*, etc., were evidently of pretransition origin; *master-commandant*, on the contrary, was evidently a recognition of a new state of things in which the master-mariner had become the *naval commander*.

COMMANDER. The title of officers of the United States and British navies next junior in rank to captains. In the United States Navy it was established by law in 1838. (See COMMANDANT.) By order of the President, of June 7, 1901, a commander may serve as commanding officer of a division, or of a ship of the second or third rate. The pay of a commander is \$3000 per annum when at sea, with an addition of 10 per cent. for each five years of service, provided the total amount does not exceed \$4000; the pay on shore duty is 15 per cent. less.

COMMANDER, LIEUTENANT. See LIEUTENANT-COMMANDER.

COMMANDER-IN-CHIEF. A relative military title, pertaining to an officer in supreme local military command, as commander-in-chief of the troops in the field. In the United States, it is primarily the absolute rank and title attached to the office of President, and also the military title of many Governors of States. Under the sixty-third article of the German Constitution of 1871, the Emperor is the supreme commander-in-chief of the Army and Navy. In England, the rank, in its permanent sense, is the highest staff appointment in the service, being subject only to the ruler, through the Secretary of State for War, who is the virtual commander-in-chief.

COMMANDER ISLANDS. A group of islands of the maritime territory of Siberia, situated in Bering Sea, east of Kamchatka, between latitudes 54° 32' and 55° 24' N. and longitudes 165° 45' and 168° 12' E. (Map: Asia, Q 3). The group consists of the two large and inhabited islands of Bering (607 square miles) and

Mednj (180 square miles) and two uninhabited islets. The climate is comparatively mild; but the inhabitants, descendants of Russians and Aleuts, are few in number.

COMMANDER OF THE FAITHFUL (Ar. *ʿAmir al-Muʿminin*). A designation assumed by the Caliph Omar, the father-in-law of Mohammed, who conquered Syria, Phœnicia, Persia, Egypt, and Jerusalem, and "organized a complete military-religious commonwealth." The title was retained by his successors in the Caliphate.

COMMANDERY. A regular assembly of Knights Templars. It confers the degrees of Knight of the Red Cross, Knight Templar, and Knight of Malta. The term was first applied, about 1260, to the property of military and religious orders, administered by members of those organizations, who were known as commanders. These had charge of the income of the estates belonging to the orders, and had authority to receive gifts and alms. They were accountable to the Grand Commander, who, in the case of Knights of Saint John of Jerusalem, resided at Jerusalem.

COMMANDING OFFICER. The officer in actual command of a vessel of war. He is an officer of the line or executive corps, and is usually addressed by the courtesy title of 'captain,' without regard to actual rank, if he is permanently in command and not merely in temporary charge during the absence of a senior. The regular commanding officer, upon leaving the ship, is succeeded by the next line officer in rank, but the latter must not alter the regulations established by his superior except in case of urgent necessity. Upon the commanding officer of a modern battle-ship there rests a responsibility the like of which is placed upon few men. He is answerable for the safety of the ship and of the crew, for the preservation of the battery, engines, boilers, and other machinery in condition for instant use, and for the conduct of all those placed under him, so far as he can control it. He is required to know every detail of construction of his ship and of her equipment, as well as of the organization of the crew. He has as an assistant an executive officer, who has charge of the organization of the personnel, and of the hull and equipment; a navigating officer, who has charge of the navigation and navigating apparatus; an ordnance officer, who has charge of the guns and ordnance stores; a chief engineer, who has charge of the propelling machinery; also a surgeon and a paymaster, the latter having charge of the accounts of the men and officers and of the provisions and clothing for the men. In the military services throughout the world, the senior officer of a regiment, corps, post, or any detachment where there is not any higher local military authority, is regarded as the commanding officer. Regimentally, the officer commanding the regiment is spoken of and referred to as the commanding officer, which usage in the British Army is still further abbreviated by the use of the initials 'C. O.'

COMMANDITE, kŏ'mān'dĕt'. SOCIÉTÉ EN, or LIMITED PARTNERSHIP. See SOCIÉTÉ EN COMMANDITE.

COMMANDMENTS OF THE CHURCH. Certain rules imposed by the Roman Catholic Church on all its members, under pain of grave sin. They differ slightly in different countries;

but in general they require the observance of Sundays and festivals of obligation by attendance at mass and rest from servile work, the observance of days of fasting and abstinence, the reception once a year at least of the sacraments of penance and holy communion, contribution in proportion to one's means to the support of pastors, and the observance of regulations in regard to marriage.

COMMELIN, kŏm'lĕn' HIERONYMUS. (?-c.1598). A Flemish printer, born at Douai. He worked at Geneva, and later at Heidelberg. The best specimens of his press are the admirable editions of the ancient classics and the Church Fathers, to the text of which, often determined by a collation of manuscripts, he added learned critical notes from his own hand.

COMMELIN, JAN (1629-92). A Dutch botanist, born in Amsterdam. He was a professor of botany in the University of Amsterdam, and founded in that city the botanical gardens which soon became the most celebrated in Europe. In description of the contents of these gardens he wrote several volumes.

COMMEMORATION (Lat. *commemoratio*, from *commemorare*, to commemorate, from *com-*, together + *memorare*, to mention, from *memor*, mindful; connected with Gk. *μέμνητος*, *memnētos*, anxious, Skt. *smar*, to remember), or **EXCÆNIA** (Lat., Gk. *ἐγκαίνια*, *engkainia*, feast of renovation or consecration, a name for Easter, from *ἐν*, *en*, in + *καίνος*, *kainos*, new). The great festival of the Oxford academic year, corresponding in some respects to the commencement of American colleges. It usually takes place on the third Wednesday after Trinity Sunday, in the Sheldonian Theatre—which, like the Sanders Theatre, Harvard, and the Kent Theatre, Chicago, is a university building. From time immemorial, public exercises have been held to mark the 'act' or period when degrees were conferred on the members of the university. At the present day, the proceedings consist of a Latin oration in honor of founders and benefactors (from which the name of the whole ceremony is derived); the conferring of degrees, not only in course, but also *honoris causa*, on distinguished strangers, who are introduced to the vice-chancellor in a short Latin speech; and the recitation, at least in part, of the Newdigate or English prize poem, and the Latin and English prize essays, the three prizes being the gift of the chancellor. The large area or floor is occupied during the proceedings by masters of arts and their male friends; in raised stalls in a semicircle around one end of this area sit the vice-chancellor, doctors, and proctors; while the galleries are filled by the undergraduates and women. The undergraduates, until recent years, used to occupy a separate upper gallery; but the license claimed by them of making unofficial and often very witty comments on the proceedings—a survival of the privileges of the *Terra Filius*, or licensed jester of mediæval times—finally reached a point where it was thought better to discourage it to some extent by breaking up the compact body of students and distributing them among the women present. Commemoration Day itself is only the culminating point of a week of gayety, marked by concerts, balls, theatrical representations, etc., which make Oxford a very attractive place to the visitor; but of late years

the glories of this season have tended more and more to be eclipsed by those of the 'Eights Week,' when the college eight-oared races are rowed, early in May. See OXFORD UNIVERSITY.

COMMEMORATION ODE. An ode by James Russell Lowell, read at exercises held at Cambridge in 1865, in commemoration of the Harvard men who had served in the Civil War.

COMMENCEMENT (OF., Fr. *commencement*, from OF. *comencer*, Fr. *commencer*, It. *cominciare*, to begin, from Lat. *con-*, together + *initiare*, to begin, from *initium*, beginning, from *inire*, to enter, from *in*, in + *ire*, to go). In American colleges, the name given to the concluding exercises of the college year, when degrees are conferred upon the bachelors, masters, and doctors completing their respective courses of study. The term is applied loosely to the graduating exercises of academies, secondary schools, etc. The custom originated in the mediæval universities, though the appropriate term was 'inception.' The inception involved two elements: (1) The recognition of the graduate or new teacher by his old master and other members of the profession; (2) the formal entrance of the newly licensed teacher upon his work by the actual performance of its duties. Hence, an essential feature of the exercises was that the recipient of the bachelor's degree should 'incept' or teach, and that the recipients of the higher degrees should defend a thesis. At Oxford this occasion was called Commemoration; but at Cambridge it was, and is yet, called Commencement. The 'inceptor' was there called 'commencer'—that is, one who commenced to teach. The ceremony and the term were a part of the inheritance received by Harvard College from Cambridge University, and thus became general among American colleges. This exercise in Colonial days was held in the fall, at the commencement of the college year, and the term is often, though erroneously, supposed to refer to this fact. As the mediæval bachelor 'incepted,' or taught, the graduate of the American college delivered an oration or dissertation before receiving his degree. With the larger colleges, even this modification of the old custom is now commonly abandoned, and in many places the Commencement exercises include only the address by the president or some distinguished educator, and the conferring of degrees. See UNIVERSITY; DEGREE; COLLEGE; CURRICULUM.

COMMENDAM (ML., acc. sg. of *commenda*, trust, from Lat. *commendare*, to intrust, from *com-*, together + *mandare*, to intrust, from *manus*, hand + *dare*, to give; originally used in the phrases *in commendam dare*, to give in trust, or *in commendam mittere*, to send in trust). A term in ecclesiastical law to denote a benefice which, being void, is *commended* to the care of some sufficient clerk to be supplied until it may be conveniently provided with a pastor. In former times bishops frequently held livings *in commendam*, in order to appropriate the revenues. The practice has well-nigh ceased in Europe, and does not exist in the United States. In the Church of England, commendams were abolished in 1836. See ABBOT.

COMMENDATION (Lat. *commendatio*, from *commendare*, to intrust). In feudal customs, the act by which a free man became a vassal. See FEUDALISM.

COMMENDATION OF OUR LADY, BALLADE IX. A ballad improperly attributed to Chaucer, according to Tyrwhitt; but really the same poem as the *Invocation of Our Lady*, ascribed to Lydgate.

COMMENSALISM (ML. *commensalis*, eating at the same table, from Lat. *com-*, together + *mensa*, table). A sort of partnership or association of two different kinds of organisms by which they endure each other's presence, do each other no harm, and in many cases are of mutual advantage; such are said to be commensals or messmates. This occurs chiefly among marine invertebrates, and is different from parasitism. Many commensals are quite free to separate, yet never dwell apart, and often could not maintain a separate existence. Others grow together so completely that they cannot separate if they would, yet are not parasites, because each retains its form and faculties, while a true parasite changes these in such a manner that it is no longer capable of obtaining food until it has been elaborated for it by the functions of its host. The most familiar example of commensalism is the small crab so often met with inside the shells of oysters—the pinnothere, or oyster-crab. Similar crabs inhabit various bivalves the world over, to the mutual satisfaction of guest and host. Within the shelter of the mollusk's pearly house the little crab is safe from its enemies, yet can dash out whenever it observes any prey in the offing and bring it home to be devoured; and the crumbs may be welcome to the oyster. The most striking examples, perhaps, are found among coelenterates and crustaceans. In the midst of the trailing tentacles, covered with stinging cells, of the Portuguese man-of-war and several jelly-fishes, live small fishes, comparatively safe from pursuit of their foes; small fishes also seek refuge among the tentacles of sea-anemones and within holothurians. Mollusks live in the burrows of sea-urchins that move about in the sand, and in the holes made by the crustacean *Gebia*—a reversal of the oyster and crab.

Certain Dromia crabs carry sponges, ascidians, or sea-anemones on their backs or claws. The anemones serve to conceal, and, by means of their netting organs, protect the crab, while they get fragments of the crab's food, or, by being transported from place to place, come in contact with more food than if they were stationary. One hermit-crab (q.v.) always bears an anemone upon its claw, which is so placed that it blocks the entrance to the shell when the crab retreats within. If the anemone dies or is removed, the crab is at pains to find and transfer a new anemone to its claw. A still more curious case is that of a polyp (*Gemmaria Americana*), found in deep water off the Newfoundland coast and allied to the sea-anemones, which attaches itself to the shell of a kind of hermit-crab, and by budding gradually covers the entire shell with a colony. "It possesses the power of dissolving the shell so that no trace of it can be found. As the polyp colony increases in size as fast as the crab grows, there is no need for the latter to change its abode, while its neighbors and competitors must frequently expose themselves to the discomforts and dangers of house-hunting." Consult: Van Veneden, *Animal Parasites and Messmates* (New York, 1876); *Cambridge Natural History*,

vol. iii. (London, 1895); Semper, *Animal Life* (New York, 1881). For fishes as commensals, consult: Jordan and Evermann, *Fishes of North and Middle America*, pp. 924, 966 (Washington, 1900); Harrington, "On Nereids Commensal with Hermit-Crabs;" *Transactions of New York Academy of Sciences*, vol. xvi., 1897, p. 215.

COMMENSURABLE (Lat. *commensurabilis*, from *com-*, together + *mensurare*, to measure, from *mensura*, measure, from *metiri*, to mete). Two magnitudes which are of the same kind, and each of which contains a third magnitude an exact number of times, are said to be commensurable—e.g. a foot and a yard are commensurable, an inch or a foot being a common measure. The numbers 15 and 35 are commensurable, each being divisible by 5.

Magnitudes which have no common measure—that is, are not multiples of the same unit, however small that unit is taken, are said to be incommensurable—e.g. the side and diagonal of a square are incommensurable. The diameter and circumference of a circle are incommensurable; 2 and $\sqrt{2}$, $\sqrt[3]{5}$ and $\sqrt[4]{7}$ are incommensurable. Numbers like $\sqrt{2}$, that are not commensurable with ordinary rational numbers, are also called incommensurable. In arithmetic, numbers prime to one another are sometimes called incommensurable, since they have no common measure except the unit of counting, which, used as a multiplier or divisor, does not change the number affected. See MULTIPLE; IRRATIONAL NUMBER.

COMMENTARIES, CÆSAR'S. The title of the two extant works of Julius Cæsar, the account of the Gallic War (*De Bello Gallico*) and of the Civil War (*De Bello Civili*). The former is a concise narration of the author's campaigns in Gaul, published in B.C. 51, in seven books, to which an eighth book was added by Aulus Hirtius. The simple and untechnical language and the importance of the matter have made it the most generally known work in the Latin literature. The memoirs of the Civil War were afterwards extended by other writers to embrace the Alexandrine, African, and Spanish wars.

COMMENTRY, kō'män'tré'. A town in the Department of Allier, France, eight miles southeast of Montluçon on the *Ôil*. It stands in the centre of one of the most important coal-fields of France, and since 1850 has risen from a mere village to a busy and populous town, whose inhabitants are mostly engaged in the coal-mines and iron-works. There are, besides, manufactures of wood and mirrors. Population, in 1901, 11,169.

COMMER, FRANZ (1813-87). A German musician, born at Cologne, in which city he studied music with Leidl and Klein. After holding a position as organist of the Carmelite church there, he went to Berlin in 1832 to study with A. W. Bach, A. B. Marx, and Rungenhagen. He was *regens chori* at the Catholic Hedwigskirche; singing-teacher at numerous schools, and founder (with Küster and Kullak), in 1844, of the Berlin Tonkünstlerverein. He was, in addition, royal music director, a senator of the Berlin Akademie, and president of the Gesellschaft für Musikforschung. He edited a number of collections of old music, and composed numerous masses, cantatas, and choruses.

COMMERCE (Lat. *commercium*, commerce, interchange, from *com-*, together + *merx*, merchandise, from Lat. *merere*, to gain, Gk. *μέρος*, *meros*, share). In its general acceptation, a term denoting international traffic in goods, or what constitutes the foreign trade of all countries as distinguished from domestic trade. The first foreign merchants of whom we read, carrying goods and bags of silver from one region to another, were the Arabs, the reputed descendants of Ishmael and Esau. Their trade was by land. The first maritime carriers of goods were the Phœnicians, who dwelt on a narrow strip of land on the eastern shore of the Mediterranean, and were the founders of the great emporiums of Tyre and Sidon. The Phœnicians established an easier and securer passage between Egypt and Syria than had before been known. The corn and wine of the Nile, and the oil, silk, dyes, and spices of western Asia flowed through their hands. From carriers they became merchants, and to merchandise they added manufactures. They traversed the shores of the Mediterranean, established colonies in the Greek islands and founded Carthage, one of the most noted commercial cities of the ancient world. The power of the Phœnicians disappeared with the rise of the Greek cities—Athens, Corinth—and of their colonies; of Carthage, then in full fame; and of Alexandria, the great seaport founded by Alexander the Great.

While Rome was giving laws and order to the half-civilized tribes of Italy, Carthage, operating on a different base and by other methods, was opening trade with less accessible parts of Europe. The strength of Rome was in her legions, but that of Carthage in her ships; and her ships could reach realms where legions were powerless. Her mariners had passed the mysterious Pillars of Hercules into the Atlantic, and established the port of Cadiz. They founded Carthage and Barcelona, and had depots and traders on the shores of Gaul. This prosperity of their commerce led to wars with Rome, which ended in B.C. 146 with the destruction of Carthage. In the same year the Romans captured and burned Corinth, which was then an important commercial city. In A.D. 273 land commerce suffered a disastrous blow, when Palmyra was in great part destroyed by the Romans.

GROWTH OF COMMERCE. The repeated invasions of Italy by the Goths and Huns gave rise to the founding, for defense and for trade, of the city of Venice, about the middle of the fifth century—a city that for more than a thousand years stood foremost in the trade of the world. The Venetians traded with Constantinople, Greece, Syria, Egypt, India, and Arabia, and their vessels carried the products of the East to the ports of western Europe. They had possessions on the coast of Greece, and became rulers in the Ionian Islands and in Cyprus. Their rivals, the Genoese, planted colonies on the shores of the Hellespont and the Black Sea, the most flourishing of which was Caffa (the modern Feodosia), in the Crimea, a great emporium of the commerce between Europe and Asia. A vast commerce was carried on in the Middle Ages by the towns of the Hanseatic League, situated on the shores of the North Sea, and the Baltic, and the rivers flowing into them. When the chief objects of commerce were the skilled products of the East, the South German cities—Nuremberg

and Augsburg—through which trade flowed inland, vied with Venice as centres of the Eastern trade. The ports of France and Spain were busy distributing centres. At the close of the Middle Ages, Antwerp, having outstripped Bruges and Ghent, became the greatest mart in Christendom. The inventions and discoveries of the fifteenth century transferred the centres of trade successively to Lisbon, Amsterdam, and London. The mariner's compass made distant voyages possible on the open sea. By 1487 the Portuguese had explored the whole western coast of Africa, and in 1497 Vasco da Gama passed round the Cape of Good Hope, to land in India in the following year. Before the end of the century Columbus had thrice crossed the Atlantic, and Cabot, sent out by England, had discovered North America. Nearly all this daring enterprise had for its prime object the finding of some easy route to the fabulously wealthy East, to India and China. But a century elapsed before the English fixed their first establishment or factory in India. The discovery of the New World, however, was destined eventually to change the course and the nature of trade.

From such rapidly spreading exploration and colonization there necessarily arose new wants, new products, new manufactures, and rapidly increasing trade; interrupted more or less by wars, but in the main marching steadily and rapidly on. The nineteenth century witnessed an extension of the commercial relations of mankind to which there is no parallel in history. The history of commerce in the past century would be an epitome of the world's economic development during its most intense and active period, and any enumeration of the causes of the tremendous strides which commerce has made must be partial. The progress of colonization in the widest sense, and the improvement of the means of transportation, are primary factors which cannot be overlooked. In the nineteenth century the greater part of the North American continent was opened up to occupation, Australia and South Africa were peopled by men of white race, while large portions of Asia were brought under the influence of Western rule or Western ideas. This, together with the great increase of population in Europe, has greatly augmented the productive power and consuming power of widely distant parts of the earth, dependent upon commerce for the supply of their mutual wants. Application of steam to transportation alike by land and by water has intensified the progress of colonization as we have here used the term, and made possible the commerce which has resulted from it.

In 1819 the Atlantic Ocean was first crossed by a steam vessel, and regular transatlantic steam communication was inaugurated in 1838. Since then the increase of steam navigation has been rapid, particularly in the last fifty years, until now the greater part of maritime navigation is carried on by steamships. Their far greater bulk and greater speed have led to the gradual displacement of the old sailing ships, and have greatly multiplied the potentialities of foreign commerce. The railway has been a factor of the greatest consequence in the development of sea-borne traffic. Before its advent it was only the produce of coast regions, or of those parts adjacent to inland waterways, which could participate in the foreign trade. But the railroad

has utterly changed this condition. Of great importance, too, has been the influence of the telegraph in transmitting orders and other communications between distant points without loss of time. These developments have made it possible to transport long distances not only goods whose weight formerly debarred them from a place in foreign commerce, but also more perishable goods which, under the slower transportation of earlier days, could not be handled.

Some notion of the rapid development of commerce can be gained from the statement that the aggregate exports and imports of the United States, which in 1791 were \$43,000,000, reached in 1850 \$318,000,000, and in the fiscal year ending June 30, 1900, \$2,244,000,000. For a comparison with earlier dates, we may select a few figures for Great Britain and Ireland, which show the development of commerce in the past three hundred years:

YEARS	Imports	Exports	Combined Imports and Exports
1613.....	£2,141,151	£2,487,435	£4,628,586
1662.....	4,016,019	2,022,812	6,038,831
1703.....	4,526,579	6,644,103	11,170,682
1770.....	11,002,000	12,142,000	23,144,000
1800.....	28,258,000	34,382,000	62,640,000
1855.....	143,542,850	116,691,310	260,234,160
1890.....	420,885,695	327,880,676	748,766,371
1900.....	523,633,486	354,550,594	878,184,080

WORLD'S COMMERCE. The aggregate commerce of the world was computed in 1890, for the total of exports and imports, at approximately \$17,500,000,000. The following statement, which gives the figures, so far as they are available, for the trade of 1901, gives some notion of the relative positions occupied by some of the leading nations:

IMPORTS AND EXPORTS

COUNTRIES	Imports	Exports
United States.....	\$880,421,000	\$1,465,380,900
United Kingdom.....	2,541,476,000	1,365,048,400
Germany.....	1,420,150,000	1,130,738,900
France.....	909,907,800	804,069,800
Switzerland.....	211,937,800	160,556,600
Belgium.....	425,690,800	352,666,800
Italy (11 months).....	326,708,200	249,232,100
Austria.....	345,587,000	383,507,600
Spain (11 months).....	148,109,400	117,678,600
Bulgaria.....	13,518,500	15,974,600
Russia (9 months).....	205,556,600	272,048,200
Canada *.....	190,415,000	177,639,000
Mexico *.....	65,083,400	70,860,400
Brazil (7 months).....	49,117,700	94,628,000
Argentina.....	109,971,100	161,846,000
Uruguay (9 months).....	18,797,100	22,352,400
Egypt.....	75,355,700	77,753,800
British India *.....	296,772,700	367,642,000
Cape Colony (11 months).....	87,749,800	44,796,500

* Fiscal year 1900-01.

COMMERCE OF THE UNITED STATES. Turning now more especially to the commerce of the United States in recent years, we present a few figures showing the origin and destination of imports and exports, and the character of the goods imported. In the following table the figures for 1895, the year showing the smallest trade of the last decade of the nineteenth century, are given for comparison with those of the

year 1900, the maximum point in the record of the century:

In the foregoing statement the increase in the export of manufactured articles is the most striking

FISCAL YEAR ENDING JUNE 30

COUNTRIES	Imports	Exports	Imports	Exports
	1895	1895	1900	1900
United Kingdom.....	\$159,100,000	\$387,100,000	\$159,600,000	\$533,800,000
Germany.....	81,000,000	92,000,000	97,400,000	187,300,000
France.....	61,600,000	45,100,000	73,000,000	83,300,000
Total Europe.....	383,700,000	627,900,000	440,600,000	1,040,200,000
North America.....	133,900,000	108,600,000	130,000,000	187,600,000
South America.....	112,200,000	33,500,000	93,700,000	38,900,000
Asia.....	79,000,000	17,300,000	139,800,000	64,900,000
Oceania.....	17,400,000	13,100,000	34,600,000	43,400,000
Africa.....	5,700,000	6,400,000	11,200,000	19,500,000
Total grand divisions.....	\$731,900,000	\$806,800,000	\$849,900,000	\$1,394,500,000

The following expresses the same matter in percentages of the total imports and exports:

COUNTRIES	1895		1900	
	Imports	Exports	Imports	Exports
Europe.....	52.41	77.76	51.84	74.60
North America.....	18.29	13.45	15.30	13.45
South America.....	15.32	4.15	11.02	2.79
Asia.....	10.61	2.15	16.45	4.66
Oceania.....	2.39	1.62	4.07	3.11
Africa.....	.78	.79	1.32	1.39
Other Countries.....	.19	.09	.....	.....

It will be observed that, with larger figures throughout in 1900 than in 1895, or larger aggregate transactions, there has been little change in the relative figures. Europe supplies us with approximately one-half of our imports, and absorbs approximately three-fourths of our exports. The most marked change in the relative figures, though it is after all slight, is seen in the falling off of exports to Europe and South America, and the increase in exports to other parts of the world.

The character of imports into the United States in general is shown in the following table:

IMPORTED MERCHANDISE ENTERED FOR CONSUMPTION

ARTICLES	1890	1895	1900	Per cent. of total value		
				1890	1895	1900
Articles of food and animals.....	\$248,600,000	\$226,400,000	\$216,100,000	32.12	30.97	26.02
Articles in a crude condition which enter into the various processes of domestic industry.....	178,400,000	187,500,000	299,400,000	23.06	25.64	36.04
Articles wholly or partly manufactured for use as materials in the manufactures and mechanic arts...	84,700,000	83,700,000	80,600,000	10.94	11.46	9.70
Articles manufactured ready for consumption.....	154,500,000	140,800,000	130,600,000	19.96	19.25	15.72
Articles of voluntary use, luxuries, etc.....	107,500,000	92,700,000	103,300,000	13.91	12.68	12.51

The list of specific articles imported is very comprehensive. Some of the most conspicuous in the importations of 1900 were: Sugar (\$100,000,000), chemicals (\$53,700,000), coffee (\$52,500,000), and raw silk (\$45,300,000).

The general nature of the exports of the United States appears in the following statement of exports:

ing and important feature. In 1880 manufacturing exports were less than one-sixth as large as those of agriculture, while twenty years later they had grown to over one-half as large. In specific classes of exports the most important features of the exports of 1900 were: Breadstuffs (\$262,700,000), cotton (\$241,800,000), provisions, meat products (\$184,400,000), iron and steel and their manufactures (\$121,900,000), mineral oils (\$75,600,000), wood and its manufactures (\$51,000,000), animals (\$43,600,000), tobacco and manufactures (\$35,400,000), and coal (\$19,500,000).

BIBLIOGRAPHY. *Commerce and Navigation of the United States*, issued annually by the Bureau of Statistics, Treasury Department; the monthly *Summary of Commerce and Finance*, of the same bureau, which contains important monographs of special topics; *Consular Reports*, issued daily and monthly, and *Commercial Relations*, published annually, by the Bureau of Foreign Commerce, State Department, give information regarding trade conditions abroad, gathered by the consuls of the United States. The preliminary section of *Commercial Relations* is a review of the world's commerce, and is also published

separately. Similar official publications are issued by other governments. The consular reports of Great Britain, France, the German Empire, Austria, Italy, and Belgium are to be especially noted, as well as the annual *Statistical Abstract of Foreign Countries* issued by the British Board of Trade.

Among historical and descriptive works, the

PRODUCE OF	1880	1890	1895	1900
Agriculture.....	\$686,000,000	\$629,800,000	\$553,200,000	\$835,900,000
".....	.....	74.51%	69.73%	60.98%
Mining.....	\$5,900,000	\$22,300,000	\$18,500,000	\$37,800,000
Forest.....	17,300,000	29,500,000	28,600,000	52,200,000
Fisheries.....	5,300,000	7,500,000	5,300,000	6,300,000
Miscellaneous.....	6,900,000	5,200,000	4,200,000	4,700,000
Manufactures.....	102,900,000	151,100,000	183,600,000	433,900,000
".....	12.48%	17.87%	23.14%	31.65%

following will be found useful: Cunningham, *The Growth of English Industry and Commerce* (Cambridge, 1890); Gibbins, *History of Commerce in Europe* (London, 1891); Levi, *History of British Commerce, 1763-1878* (London, 1880). Among popular compendia of information about commerce, notice should be made of the numerous works on commercial geography which have recently issued from the press. One of the best is Chisholm, *Handbook of Commercial Geography* (London, 1890). See BALANCE OF TRADE; EXCHANGE; FOREIGN MONEY.

COMMERCIAL COURT. A court constituted of judges of the King's Bench Division, in England, for the trial of commercial causes—that is, of causes arising out of the ordinary transactions of merchants and traders, such as those relating to the construction of mercantile documents, the export or import of merchandise, affreightment, insurance, banking, mercantile agency, and mercantile usages. It was not established by an act of Parliament, but was devised by the King's Bench Division for the convenience of suitors and the more expeditious determination of mercantile disputes. While this court has no power to dispense with the ordinary rules of evidence, or to depart from the administration of the law in the ordinary way, it is able, with the assistance of parties and counsel, to dispose of commercial disputes with as much promptness as an arbitrator. Commercial cases are tried by this court upon the evidence prescribed by the orders made in chambers, without difficulty or delay, and with a great diminution of the cost incidental to actions in which the ordinary modes of litigation are followed. This court is a reminder of the Court Piepoudreux, in which the primitive law merchant (q.v.) of England was administered—the court which Lord Coke declares was “incident to every fair and market, because that for contracts, and injuries done concerning the fair or market, there shall be as speedy justice done for the advancement of trade and traffic as the dust can fall from the feet.” The connection of this court with merchants of the staple is disclosed by 27 Ed. III., c. 2, which declared that it was designed to give courage to merchant strangers to come with their wares into the realm, and that it should dispense justice according to the law of the staple, or the law merchant, and not according to the common law. Courts for the rapid settlement of trade disputes, and called Pypowder courts, were provided for in New York in 1692 (vol. i., Col. Laws, ed. 1894). (See COURT.) Consult the article, “Merchants of the Staple,” in 17 *London Quarterly Review*, 56 (London, 1901).

COMMERCIAL CRISES. See CRISIS, ECONOMIC.

COMMERCIAL EDUCATION. See EDUCATION, COMMERCIAL.

COMMERCIAL GEOGRAPHY. See GEOGRAPHY, ECONOMIC.

COMMERCIAL LAW. A popular term of varying and rather indefinite signification. It includes, ordinarily, the legal rules which relate most directly to every-day mercantile transactions, and which are based upon, or have been modified by, the usages of trade. These rules are presented in connection with the different topics of commercial law, under such titles as

BAILMENTS; INSURANCE; NEGOTIABLE PAPER; PARTNERSHIP; SALE; etc. See also LAW MERCHANT; MERCANTILE LAW.

COMMERCIAL PAPER. See BILL OF EXCHANGE; NEGOTIABLE PAPER.

COMMERCIAL REGISTERS. See MERCANTILE AGENCY.

COMMERCIAL TEMPERANCE LEAGUE. See LEND-A-HAND CLUBS.

COMMERCIAL TRAVELER. A representative of a wholesale or jobbing house, sent throughout the country for the purpose of selling goods to smaller houses in the same line of trade. The commercial traveler is the legitimate successor of the old peddler, though his operations are on a larger scale, and his manner of doing business quite different. In former days, in addition to the peddler, who carried his stock of wares with him, producers frequently came into contact with the purchasers through the great fairs which were held throughout the year in the different commercial centres, and which were a means of drawing sellers and buyers together from great regions of country. The commercial traveler sells by the aid of samples, price-lists, and the like, and carries with him no goods for sale. The system of employing commercial travelers is a natural outgrowth of the localization of interests in particular places, and of the extension of the markets for particular commodities. It is estimated by the commercial travelers themselves that their class numbered in the United States in 1890 some 300,000 persons. It is claimed by them that since that time their number has decreased, largely through the concentration of capital and the concentration of the management of business in the hands of the so-called trusts. It is claimed by the managers of trusts that one of the chief advantages of their organization has been the saving in the cost of distribution, notably in that of selling goods. It is represented that the various factories and enterprises each employ commercial travelers, whose main duty is not to induce the would-be purchaser to buy, but to persuade him to buy a particular make of goods. As the competition between the different sellers of the same goods ceases by the combination of interests, it is obvious that, instead of sending several salesmen into a district, one can transact all the business it offers. The commercial travelers in the United States are organized in various associations for the purpose of promoting their interests as a class. Of these, perhaps the most important is the Commercial Travelers' Protective League. Consult: Testimony of P. F. Dowe before the United States Industrial Commission, in vol. iv. of the commission's *Report* (Washington, 1900); also Jenks, *The Trust Problem* (New York, 1900).

COMMERCEY. kô'mâr'sé'. The capital of an arrondissement in the Department of Meuse, France, on the Meuse, 183 miles east of Paris by rail (Map: France, M 3). It is a garrison town, and has an interesting seventeenth-century castle, with literary associations of Cardinal de Retz, which also for a time was the residence of Stanislaus, King of Poland and Duke of Lorraine. A statue of Don Calmet, the historian, who was born near Commercey, stands in the town. Coal-mining constitutes the chief industry. The town

has a specialty in the manufacture of cakes known as 'madeines.' Population, in 1901, 7726.

COMMERS, *kô-mèrs'* (Ger. *Kommers*, drinking-bout, from Lat. *commercium*, trade, from *com-*, together + *merca*, merchandise). A social gathering of German students on festival occasions, such as the beginning and ending of the semi-annual term (*semester*), the anniversary of the foundation of the university, etc. The main features of these meetings consist in speeches and songs, the famous collection of German student songs, *Gaudeamus igitur*, being used. Several senior students are elected as officials (*Chargierte*), and have entire charge of the affair. Certain rules of etiquette in drinking must be strictly adhered to. Beer is the sole beverage used, and generally a great quantity is consumed. After each speech the presiding senior calls for a salamander (*ad exercitium salamandris, bibite, tergite*). All arise, and, after having emptied their glasses, pound three times vigorously with them on the tables. If a club-member dies, at the next club commers a salamander (*Trauersalamander*) is executed in his memory, and then all glasses are dashed to pieces. Each students' club arranges a large commers on the anniversary of its foundation. A great many former members visit their alma mater on this occasion, and the one present who can count the most semesters since his matriculation as a student is especially honored.

COMMUNION (Lat. *comminatio*, threat, from *comminari*, to threaten, from *com-*, together + *minari*, to threaten). The name given to a penitential service used in the primitive Church. In the early Church those who were guilty of grievous and notorious sins were put out of the Church, until, on their repentance, and after long trial, they were restored to full communion. It seems that, at least from the beginning of the eighth century, there was an office of this kind for public penitents on the first day of Lent; but from various causes the penitential discipline became extinct, both in the Eastern and Western churches, and the office for Ash Wednesday (so called from the penitents formerly coming clad in sackcloth and ashes) is the only memorial of it left. The office, as used in the Church of England, is nearly the same as the older ones found in the pre-Reformation service-books of Salisbury and York. The curses contained in Deut. xxvii. against impenitent sinners are read, and the congregation answers 'Amen' to every sentence, as acknowledging the justice of the sentences. The penitential office of the American Book of Common Prayer is without comminatory features. Consult Bingham, *Origines Ecclesiasticæ*; or, *the Antiquities of the Christian Church* (10 vols., London, 1710-22; late ed., 1838-40).

COMMISSARIAT (Fr., from ML. *commissarius*, one intrusted with a commission, from Lat. *commissus*, p.p. of *committere*, to commit, from *com-*, together + *mittere*, to send). A department of army supply. In the United States the commissariat, under the commissary-general of subsistence, provides the food for the troops, while its transport, together with the supply of clothing, etc., is the work of the quartermaster's department.

In Great Britain the commissariat and army service corps are responsible for both supply and

transport of food. Owing to the constant demands made upon it, and its peculiar importance under the present army system, this branch of the British Army is probably unrivaled by that of any other country. A similar system of commissariat to that of the United States obtains throughout Europe generally. See ARMY ORGANIZATION; FIELD COOKING; RATIONS, MILITARY.

COMMISSARY (Fr. *commissaire*, ML. *commissarius*, commissary, one intrusted with a commission). An officer of the Subsistence Department of the United States Army. This bureau is organized to provide for the distribution and expenditure of funds appropriated for the food of enlisted men, and for purchasing articles kept for sale to officers and men. The department comprises: one commissary-general; two assistant commissary-generals, with rank of colonel; three assistant commissary-generals, with rank of lieutenant-colonel; nine commissaries, with rank of major; eight commissaries, with rank of captain; 200 commissary-sergeants, post and regimental; making a total of 223, all ranks. The commissary-general furnishes lists of all articles kept for sale and gives instruction for procuring, distributing, issuing, selling, and accounting for all subsistence supplies. Purchasing commissaries make purchases of supplies and distribute them as directed; and upon direct calls of chief commissaries they transfer to commissaries of posts and stations such funds from the appropriations for the subsistence of the army and such authorized subsistence supplies as chief commissaries, under instructions from department commanders, deem necessary. Commissaries are required to make timely requisition and estimates, subject to approval by their commanding officers, for funds and supplies for the troops with which they serve, forwarding them, through the regular military channel, to the chief commissaries. *Post commissary-sergeants* are appointed from the enlisted men of the army; only those being qualified who have served at least five years, during three years of which they must have held non-commissioned rank. The appointment is usually bestowed as a reward to faithful and well-tried sergeants. At military posts and stations and in the field, the *regimental commissaries*, who are officers of the rank of captain and are appointed to the regimental staff for a term of four years by the commanding officer, assisted by regimental commissary-sergeants, perform their duties in the subsistence department at the headquarters of their regiment. *Regimental commissary-sergeants* of infantry and cavalry regiments belong to the non-commissioned staff. There is one to each regiment. The duties of the commissary, in the English Army, are performed by the Army Service Corps; and regimentally, by the regimental quartermaster, assisted by his quartermaster-sergeant.

COMMISSION (Lat. *commissio*, commission, from *committere*, to commit, from *com-*, together + *mittere*, to send). The name applied to boards created for governmental purposes, generally of a temporary nature. They have proved effective agencies for dealing with certain phases of international relations and controversies, and for this purpose are of two classes: (1) Commissions of a domestic character, created

under statute for carrying out provisions of treaties and conventions. (2) Commissions performing international functions, in the nature of conference or arbitration boards.

Examples of the first class in the United States are the commissions created (a) under the Treaty of 1819 with Spain, ceding Florida, by which the Government sought to adjust citizens' claims growing out of the preceding unfriendly relations; (b) under the Treaty of 1826 with Great Britain, to distribute the indemnity for slaves deported in derogation of Art. 1 of the Treaty of Ghent; (c) under the Treaty of 1831 with France, to distribute the indemnity paid for the Spoliation Claims; (d) under the Treaty of 1871 with Great Britain, to distribute the Alabama Claims award.

Commissions of the second class have been the usual agencies for effecting arbitrations, and, according to their purpose and the authority of their members, may be either merely for conference or for the determination of methods of reaching settlement of disputed questions, or may themselves have the power to adjudicate the issues in controversy. In the latter case they may be composed solely of representatives of the States concerned, or they may include neutral parties selected by these States to act as umpires. During the nineteenth century arbitration as a method of settling international differences steadily increased. The United States has been a party to no less than sixty-eight adjustments of this character, and except for the train of circumstances resulting in the War of 1812, all differences between this country and Great Britain have been so adjusted. See ALABAMA CLAIMS; ARBITRATION (INTERNATIONAL); BERING SEA CONTROVERSY, and consult the authorities there cited.

COMMISSION, MILITARY. A certificate of authority or rank; or both. Military rank is defined in the United States Army Regulations as "that character or quality bestowed on military persons, which marks their station, and confers eligibility to exercise command or authority in the military service within the limits prescribed by law." To such military persons commissions are granted only by the President of the United States and published through the Adjutant-General's department. Commissions in European armies are usually distributed among the graduates of the national military preparatory or training colleges, according to the results of competitive examinations. They are universally restricted, however, even in republican France, to men of good birth or wealthy heritage. In the British Army, formerly, commissions were obtainable by purchase—a condition of things which became more and more undesirable as the science of war advanced, and thorough preparatory education and training became necessary. It was not until 1871 that the system was abolished by the Gladstone Government in the face of great opposition, and the present condition of things inaugurated. The prices of commissions rose gradually from the time of Charles II. until the Crimean War of 1854, at which period they ranged in value from £450 for a commission as ensign of infantry of the line, to £9000 for that of lieutenant-colonel of Foot Guards. See ARMY ORGANIZATION; RANK AND COMMAND.

COMMISSIONAIRE, kōm-mish'ūn-ār', *Fr.* pron. kō'mě'syó'nār' (*Fr.*, commissioner). An

attendant at Continental hotels, employed to perform certain miscellaneous services, such as to attend at the arrival of railway trains and steamboats to secure customers, take charge of luggage, see it passed through the custom-house, and send it on to the hotel, etc., for all which they charge a fee. In Paris they are generally respectable and intelligent, and speak English with tolerable fluency. In other parts of the Continent, as in Germany and Austria, there is also a class called *commissionaires*, who are analogous to the American messenger boys. They are employed by companies and are unformed, but one may not call them up by telephone or signal as here, it being their custom to solicit services upon the street. A corps of *commissionaires*, consisting originally of disabled soldiers who had retired with a pension, was founded in Great Britain in 1859, the service of which now extends throughout the large cities. The men are employed in the most varied capacities where high qualifications are required, and may be engaged for permanent or temporary service. The corps numbered over 2500 in 1900.

COMMISSIONER (from *ML. commissarius*, one intrusted with a commission). Most commonly a person appointed for public service by a commission or mandate of a political authority; but also, sometimes, any one of certain officers elected by popular vote. The term is generally employed to describe an appointive officer who has charge of some branch of a department of government and who is subject to the supervision of a higher official or public board, as a commissioner of water-supply of a municipality, who is usually under the control of the mayor or common council. It is the almost invariable title of persons appointed by the Government to carry on or supervise some special public work of a transitory nature, as to investigate the conditions and resources of a colony.

COMMISSIONER OF ASSIZE, in English law, is one to whom a commission is issued by the Crown, directing him to 'take the assizes'; that is, to act as a justice in hearing certain actions in specified judicial circuits. It may issue to a barrister or sergeant at law as well as to a regularly appointed judge. The practice of appointing these commissioners arose during the reign of Edward I., because of the lack of regular courts in the various parts of the country. By the Supreme Court of Judicature Act of 1873, one exercising jurisdiction under a commission of assize is deemed to constitute a court of the High Court of Justice, having all the powers of that court. See ASSIZE; HIGH COURT OF JUSTICE.

COMMISSIONER OF DEEDS is a person authorized by the State to take acknowledgments of the execution of legal instruments and administer certain oaths voluntarily taken out of court. His powers vary in each jurisdiction, and are somewhat similar to, but usually more limited than, those of a notary public. See NOTARY PUBLIC.

COMMISSIONERS, BOARD OF NAVY. See UNITED STATES, *Navy*.

COMMISSIONERS OF THE NAVY. See ADMIRAL; also NAVIES, section devoted to Great Britain.

COMMISSION MERCHANT. A person, called also a *factor*, employed to sell goods con-

signed or delivered to him by another who is called his principal, for a certain percentage, commonly called his commission or factorage. As the goods thus received are said to be consigned, the commission merchant or agent is often called a consignee. See FACTOR.

COMMITMENT (from *commit*, Lat. *committere*, to commit). A warrant of a justice, magistrate, or other official having police jurisdiction, ordering that a person accused of a crime be held for trial, and either directing that he be sent to prison immediately or admitting him to bail to secure his attendance at that time. The term *commitment* is also sometimes used of the sending a person to jail to enforce obedience of an order or decree of a court; but the term is most frequently used where the person is to be detained for some temporary purpose, as above indicated. It is seldom employed where the prisoner is finally sentenced to a term in prison as a punishment, after having been found guilty of a crime, in which case the judgment of the court is usually considered a sufficient warrant for the sheriff or proper authorities to carry out the sentence. See JUDGMENT; SENTENCE; SHERIFF; WARRANT.

COMMITTEE (Lat. *committere*, to intrust). A group of persons, rarely less than three, to whom an organized body, legislative or otherwise, intrusts or *commits* certain matters for investigation, consideration, and decision as to their meriting the attention of the whole body. A *standing committee* is one which exercises its functions permanently and considers all matters coming within a certain allotted sphere of action. In modern parliamentary practice, immense importance attaches to the work of standing committees; and so true is this that modern legislation has been by some termed government by committee. Almost every matter brought before such bodies as the United States Congress and the legislatures of the several States is at once referred to a standing committee, which holds meetings by itself, examines the subject closely, summons witnesses, if necessary, and at length reports back to the main body its findings and conclusions, with recommendation to act favorably or adversely. The committee usually formulates its conclusions in a bill recommended to be passed if action is thought desirable. The same procedure is followed in the British Parliament. The United States House of Representatives has at least sixty committees; the Senate about fifty; these consist of not less than three, and, except in one or two cases, not more than fifteen members. The most important committees of the House are, that of Ways and Means, which considers all matters relating to the tariff, internal taxation, and, generally, the revenues of the Government, and that of Appropriations, which deals with all estimates of appropriations to be made by Congress and the framing of bills for that purpose. Other important standing committees are those of Banking and Currency, Foreign Affairs, Patents, Pensions, Judiciary, and Railways and Canals. Similar committees exist in the British Parliament. The argument in favor of the system of committees is the impossibility of a large deliberative body's examining every matter within the scope of its action in detail; the objection to it is the possibility of more

easily corrupting or deceiving a small body than a large one; but whatever be the argument against it as a matter of theory, the committee system is fully recognized as a necessity and is too firmly entrenched in parliamentary practice to be successfully argued against. A *select committee* is one appointed at a special time to consider and report on a given topic; when this has been done its powers and existence cease. The *committee of the whole* is the entire body sitting in a deliberative rather than a legislative character—for the purpose, that is, of debating and consulting upon the details of a question rather than of taking legislative action upon it. In the British House of Commons there is a regularly chosen chairman, other than the Speaker of the House, who presides over all committees of the whole; in the United States Congress any member may be chosen to preside in a committee of the whole. A *joint committee* is one made up of separate committees appointed by two bodies; in the United States, owing to the dual constitution of the legislatures, it is often necessary to appoint such joint committees to bring the two bodies to a mutual understanding and make harmonious action possible.

In law, a committee is a person or persons appointed by a court having equity or probate jurisdiction to take charge of the person, and manage the property and business affairs, of an individual who is legally incompetent by reason of lunacy, idiocy, or habitual drunkenness. The duties are much similar to those of a guardian of an infant, and the committee is under the supervision and control of the court appointing him. He must file inventories and accounts, maintain all necessary actions in behalf of his charge, and apply the income, and the proceeds of the property itself if necessary, to the support of the incompetent and his family. If the incompetent recovers, he may apply to the court to have the committee discharged and resume his personal freedom and the control of his property. The power of the committee ceases at the death of the incompetent, and his estate is administered in the usual manner. See GUARDIAN; LUNATIC; HABITUAL DRUNKARD; IDIOCY.

The term is also employed to designate a person or persons appointed to take charge of specified matters by any body organized for governmental business or social purposes, and to make a report of the result of their efforts to the appointing power. See LEGISLATURE; PARLIAMENTARY LAW.

COMMITTEE, THE. A comedy, by Sir Robert Howard, published in 1665, but played for several years previously. In 1797 Knight brought out an adaptation of it under the title of *The Honest Thieres*.

COMMODATUM. See BAILMENT.

COMMODOE, kó'mód' (Fr., *Commodus*). A play by Thomas Corneille, played at the Louvre for Louis XIV. in 1659.

COMMODIANUS. A Christian Latin poet, who lived in the third century A.D. The place of his birth is not known, but he is supposed to have been of African extraction. His extant poems, *Instructiones per Litteras Versuum Primas* (in acrostic and telestic verse), and the *Carmen Apologeticum*, both of which are aimed against the heathen and the Jews, lack poetic

fire, and present few attractions as literary productions. Although some attempt is made to imitate the general rhythm of the hexameter, the rules of quantity are utterly neglected, and the author employs a peculiar prosody, based partly on accent and partly on syllabic quantity. Consult the edition by Dombart (Vienna, 1888), and the English prose translation of the *Instructions*, in *Anto-Nicene Fathers* (Buffalo, 1886-96).

COMMODORE (probably from Sp. *comendador*, It. *commandatore*, OF. *commandeor*, Fr. *commandeur*, commander). Previous to 1862 the courtesy title of commodore was given to all captains in the United States Navy who had commanded a squadron, but no actual rank higher than that of captain existed. In July, 1862, the first captains to hold a higher office were commissioned as commodores. In 1882 the number of commodores on the active list was reduced from twenty-five to ten, and in 1899 the grade was abolished and the ten commodores on the list promoted to the rank of rear-admiral, the numbers in that grade being increased from six to eighteen. In the British Navy captains having certain important commands are officially styled commodores, and have an increase of pay while on this duty, but there is no grade of commodore on the British Navy List. See ADMIRAL.

COMMODUS, LUCIUS ÆLIUS AURELIUS. A Roman Emperor (A.D. 180-192). He was born in A.D. 161, and was the son of Marcus Aurelius Antoninus. Great pains were taken with his education. But the solicitude of his father was all to no purpose. Commodus waited only for an opportunity to exhibit as startling and detestable a mixture of sensuality, cruelty, and meanness as had ever been witnessed in Rome. When he was summoned to the throne on his father's death (March 17, 180), he plunged into the dissipations of Rome. At that period he was successfully fighting the Marcomanni and other tribes on the Upper Danube, but he hastily concluded a treaty with the barbarians, and reached the capital in the beginning of the autumn. The cruelty to which he was always prone was especially exhibited after a conspiracy by his sister Lucilla against his life had been discovered in the year 183. Nearly all who had risen to honor during his father's lifetime were sacrificed to appease his jealousy of the good and the great. Gross prodigality also marked his reign. He was proud of his own physical strength, and exhibited it in gladiatorial combats. For each of these exhibitions he charged the State an enormous sum. He used also to sing, dance, play, act the buffoon, the peddler, or the horse-dealer, and engage in all the filthy and horrible orgies of Egyptian sacrifice. A glutton, a debauchee, who wallowed in the most sensual abominations, he yet demanded to be worshiped as a god, and assumed the title of Hercules Romanus. Many plots were devised against his life, and at last one of them succeeded. His mistress, Marcia, in concert with the prefect Lætus and the Imperial chamberlain, Eclectus, after they had failed in an attempt to poison him, caused him to be strangled by Narcissus, a famous athlete. The life of Commodus, written by Lampridius, is to be found in the so-called *Augusta Historia*.

COMMON (OF. *comun*, Fr. *commun*, from Lat. *communis*, OLat. *comoinis*, common). In the law of real property, the right of one person, in common with others, to take a profit from the land of another. The person over whose land the right is exercised may be a private owner or the State. The term is somewhat loosely employed as the equivalent of *profit à prendre* (q.v.): but such a 'profit' may be exclusive, or 'several,' in which case it is not properly characterized as a common. Blackstone, however, seems to use the term in this sense, and he enumerates four species of commons, viz.: *Common of pasture*, or the right of feeding one's beasts on another's land; *common of piscary*, or a liberty of fishing in another man's water; *common of turbary*, a liberty of digging turf upon another's ground; and *common of estovers*, a liberty of taking necessary wood, for the use or furniture of a house or farm, from off another's estate. These rights, with the various other *profits à prendre*, will be considered under that head. See HEREDITAMENT; INCORPOREAL.

The term is often used to denote the common use of a piece of uninclosed ground possessed by all the inhabitants of a village or hamlet. The right of common is 'disturbed,' as the legal phrase is, when one who is not possessed of the right unlawfully infringes it, or when one possessed of the right exceeds his lawful use, or where one wrongfully prevents others possessed of the common right from exercising it, as where he incloses the land. In Great Britain the right of common was formerly possessed from time immemorial in almost every village with regard to certain pieces of land which were not held by any owner in fee, but might be fairly considered to belong to the community as a body. Statutes, both public and private, permitted the inclosing of such common land under various conditions, such as the consent of two-thirds of those exercising the right of common. By this legislation, and by acts of usurpation on the part of individuals, much of the common land has been lost; of late years the further inclosure of common land has been to some extent guarded against. In the United States the most frequent use of the term is as a substantive to denote a piece of ground set apart for public uses, such as open-air meetings, reviews, and for the general pleasure of the people at large. See PROPERTY, and the authorities there referred to.

COMMON, DOL. Subtle's mistress, in Ben Jonson's *Alchemist*, who becomes "Queen of the Fairies," or "a most rare scholar, gone mad with studying Broughton's works," as suits the occasion of the swindlers or the demands of their dupes.

COMMON, TENANCY IN. The most usual form of joint or common ownership of lands or goods. It may be constituted of two or any greater number of persons, who may have equal or unequal shares, and whose titles and interests are distinct although undivided from those of their colleagues. Accordingly, while the tenant in common cannot claim any specific portion of the property as his own, he may, nevertheless, deal freely with his undivided share, alienating or devising it at his pleasure, or he may, by appropriate legal action, compel the partition of the property; whereupon, if it be divisible in fact, his share will be set off to him, as a sepa-

rate parcel, in severalty. If it be not physically severable—as a mansion or a horse—the courts will direct its sale and the distribution of the proceeds among the several owners in the proportion of their respective interests. If the estate of a tenant in common be of an inheritable nature—as an estate in fee simple—it will, upon his death, descend, like his other real property, to his heirs. In the event of a conveyance or descent of such an interest, the new holder simply takes the place of his grantor or ancestor, and becomes a tenant in common with the surviving co-tenants of the latter.

In its incidents, the tenancy in common is at the present time not distinguishable from the estate which arose at common law by the descent of lands to two or more heirs who were entitled to share the estate. (See *COPARCENARY*.) Indeed, this is now in the United States the more usual method of creating a tenancy in common. It is, however, to be sharply distinguished from the other forms of common ownership, as joint tenancy, tenancy by entireties, and partnership, the two former of which are attended by the incident of survivorship, and the last of which is affected by the peculiar qualities of the partnership relation.

At common law, upon a conveyance of lands to two or more persons without more being said, they took the property as joint tenants, and not as tenants in common. This presumption has generally been reversed by statute in modern times, and now such a grant will vest the property in the grantees as tenants in common, unless the deed declares that they are to take as joint tenants. See *OWNERSHIP*; *PROPERTY*; and the authorities there referred to.

COMMON ASSURANCE. The technical description of the ordinary processes for conveying the title to land. The term assurance was also employed, without the qualifying adjective, in such phrases as 'a covenant to make further assurance' (meaning a covenant to protect the title conveyed by making or procuring the making of any further instrument which might be necessary for that purpose), but the instrument or act of conveyance itself was always described as a common assurance. Blackstone defines common assurances as the legal evidences of the translation or transfer of real property, and comprehends under that description the four following modes of alienation: (1) By matter *in pais* or by deed; (2) by matter of record, or an assurance transacted in the King's public courts of record; (3) by special custom obtaining in some particular places and relating only to some particular species of property; (4) by devise.

By *matter in pais* is meant a transaction to be evidenced by witnesses before a jury, and it has reference to the old common-law method of conveyance by feoffment or livery of seisin. The deed referred to is the deed of grant, which has in modern times come to supersede most of the other modes of transfer. Alienation by *matter of record* includes assurance by private acts of Parliament, the King's grants, and the awkward processes by fictitious suit, known as common recovery and fine. Under alienation by *special custom*, Blackstone describes only the peculiar mode of conveyance 'by surrender and admittance,' whereby copyhold lands were transferred. *Devise* was employed in the same sense as that which it now bears, and included any gift of

land, present or future, or of any interest in land, by last will and testament.

It will be noticed that these four modes of conveyance comprehend every form of voluntary alienation of real property, only involuntary alienations, as by forfeiture, escheat, bankruptcy, eminent domain, and the like, and the transmission of lands by descent, being omitted from the category of common assurances. See *ALIENATION*; *CONVEYANCE*; *TITLE*; and the names of the various common assurances referred to above. Consult the *Commentaries* of Blackstone, Stephen, and Kent, and the authorities referred to under *CONVEYANCING* and *TITLE*.

COMMON BENCH. The earlier name of the English Court of Common Pleas. See *COMMON PLEAS*, *COURT OF*.

COMMON CARRIERS. See *CARRIERS*, *COMMON*.

COMMON COUNCIL. The name usually applied to the local legislature in American cities. Usually a legislative body, so called, consists of only one chamber, but the term may be applied to a bicameral body as well as to one chamber in a bicameral assembly.

COMMON COUNTS. In law, in general, technical forms for stating a cause of action, used particularly in assumpsit (q.v.), in order to take advantage of proof which might vary from the particular facts and circumstances alleged and yet justify a recovery. Common counts were founded on an express or implied promise to pay money. Those in most general use were known as counts for 'goods sold and delivered'; 'work, labor, and services'; 'money paid'; 'money had and received'; 'money lent'; 'account stated'; and 'use and occupation.' Their names are somewhat descriptive of their purposes: thus under the count 'money had and received' the plaintiff could prove any circumstances under which the defendant received money which, in law, he ought to pay or return to the plaintiff. The money may have been obtained by fraud, but a fictitious promise to pay could be alleged, the fraud proved, and it was held the law implied a promise to pay on the part of the defendant. The common counts originated in England, but were abolished, together with all ancient forms of action, by the Judicature Acts. In the United States they are still used in some of the States where common-law pleading is retained. See *COMMON FORMS*; *PLEADING*.

COMMONER. In England, a term applied to all citizens except the hereditary nobility. John Hampden was called the 'great commoner,' and the title was also given to the elder Pitt before he became a member of Parliament. In Oxford University, students of the second class who pay board are called commoners, ranking between gentlemen commoners and bursars.

COMMON FORMS. In law, the forms of personal actions in common-law pleading (each action having a general form of declaration or complaint), the allegations in which were usually fictitious, but which had a recognized meaning and which would be supported by a certain line of proof. Thus, in the action of trover (Fr. *trouver*, to find) it was alleged that the plaintiff lost a chattel and that the defendant found it, and this allegation could not be traversed or denied by the plaintiff, but plaintiff could prove

any facts which in law would entitle him to the chattel and disregard the fiction of finding. These forms of pleading originated in the feudal period in England, and they arose out of the practice of granting a writ for trying the justice of some complaint for the redress of which there was no other provision in the law. The following forms of action were in general use: assumpsit, covenant, debt, detinue, replevin, trespass, trespass on the case, and trover (qq.v.). These forms were generally adopted in the United States, but the Civil Codes of many States have abolished them. They have also been abolished in England by the Judicature Acts. See COMMON COURT; PLEADING.

COMMON LAW. The great body of English unwritten law (from which also is, in the main, derived the common law of the English colonies and of the United States), as distinguished from written or statutory law, from the Roman civil law, from international law, and from the systems of law administered by courts of equity and admiralty courts. Blackstone divides the civil law of England into the *lex scripta*, or statute law, and *lex non scripta*, or common law, and defines the latter as consisting of general customs, of particular customs prevailing in certain districts, and of certain laws used in particular courts. Common law is based primarily on customs growing out of the united wisdom and experience of mankind; these customs in time become recognized as reasonable, consistent, and established, are sanctioned by the courts, and are interpreted and made binding by the decisions of the final courts of appeal. While Continental countries generally follow the carefully classified and codified system of the Roman civil law, the common law of England was a growth, gradual and in its origin complex—derived from the customs and precedents of Anglo-Saxons, of Normans, of the united England which followed the Norman rule, and including also some principles and practices derived through one of these sources from the Roman law itself. It must be remembered that even at the time of the Norman Conquest, England had a definitely established, though, of course, crude, legal system, and on that system much of the common law, though perhaps not the greater part, rests.

From its nature, the common law cannot be sought in any one book or digest; its principles are discussed in the treatises of innumerable writers of text-books and commentaries, and in the records of the decisions of the courts. Commentators cannot make law, but they may discuss and record it. The real oracle of the common law is the judge, who considers and weighs precedents, measures them by the standard of reason and public policy, and sets finally the seal of authority upon them by his decision. Great importance, therefore, is attached to precedent in ascertaining the principles of the common law; it was, it is conceded, because too much importance was attached to precedent that, side by side with the system of common law, grew up, to correct and supplement it, a system of equity law. (See EQUITY.) On the other hand, the greatest jurists of the English bench have most widely recognized the fact that precedent must be tempered by reason. Lord Mansfield, more than any other one judge, enlarged in this way the interpretation and application of common-law principles, and was accused, indeed, of

assuming legislative rather than judicial powers. But there can be no question that his view, carried out with unswerving devotion to natural justice, to the necessities of growing and changing mercantile and legal conditions, and to the true fundamental principle of precedents, did much to make the administration of law in England pliable and efficient. We may illustrate the manner in which common custom became common law by citing the recognition by courts of the already long-established principle of primogeniture: of the similar recognition of the fact that the validity of a deed depends on its being sealed and delivered; of the recognition of the principle that wills should be less strictly construed than deeds; of the sanctioning the already existing mercantile custom that three days of grace should be given in payment of notes and bills. In all these cases the law did not make the custom or principle, but found it ready made to hand, recognized its convenience and usefulness, and sanctioned it by judicial authority.

Though based so firmly on custom and precedents, the common law is not totally inelastic. The continual growth of modern civilization, the progress of invention and manufactures, and the increased complexity of business—all have demanded from the common law recognition and an adaptation of the law to the conditions of the time. The rule generally followed as to precedents is that the courts will always "abide by former precedents where the same points come again into litigation." But the decision of one of two courts of concurrent jurisdiction does not necessarily bind the other, nor will a new decision by a court of appeal always be supported by that very court in subsequent cases. It follows, therefore, that often precedents almost equal in number and authority may be quoted on both sides of a given question, and in such a case the power and authority of the court appealed to are called upon to decide as is consonant with justice and reason. In the United States, as each State has a final court of appeal, and as theoretically they are of equal authority, such a contradiction of precedents and decisions is frequent.

The United States, considered as one body politic, has no common law; Federal courts, when acting as common-law courts, follow the common law as it stands in the particular State where the action arises. As for the States themselves, the common law of England, as it existed at the time of the Revolution, together with such of its statutes as reasonably applied to the Colonies, became at that time the common law of the States. In the United States, as in England, of course, the body of the common law has developed with growing industrial conditions, and has, on the other hand, been from time to time restricted by statutes of the States or of the United States. What we have said in regard to the common law of the States has one exception—Louisiana, which, when ceded to this country, retained in the main the system of Roman civil law already existing. The common law on a given point is always superseded by a statute covering that point. Thus, in the United States the order of authority of law is: The Federal Constitution; the treaties and acts of Congress; the Constitution of the State; the statutes of the State; and finally the common law. When a statute is rescinded, the common law on that

point again becomes of force, unless there be an older unrescinded statute, in which case that revives. For a sketch of common-law courts, pleading, etc., see COURT; PLEADING; etc.

BIBLIOGRAPHY. Consult: The commentaries of Blackstone, of Kent, of Stephen (13th ed., London, 1899), of Broom (9th ed., London, 1896); Coke, *First Part of the Institutes of the Laws of England: or a Commentary upon Littleton* (any edition); Pollock and Maitland, *History of the Laws of England* (2d ed., Boston, 1899); Stephen, *History of the Criminal Law of England* (London, 1883). For a statement of the elementary principles of the common law, consult: Robinson, *Elementary Law* (Boston, 1882); Minor, *Institutes of Common and Statute Law* (2d ed., Richmond, 1876-79).

COMMONPLACE-BOOK. A sort of scrap-book for jotting down memoranda, occasional thoughts, or ideas for subsequent development. Southey, Dickens, and Charles Reade, for example, kept commonplace-books of which they made much use.

COMMON PLEA. Any civil action between individuals, as distinguished from criminal proceedings, or other cases where governmental matters are involved. See CIVIL ACTION; PROSECUTION.

COMMON PLEAS, COURT OF. One of the great historic tribunals of the common law in England. It was instituted, as a separate jurisdiction, in the reign of Henry III., under the name of the Court of Common Bench, but its real origin lies further back, in the provision of Magna Charta that common pleas (*communia placita*) should no longer follow the King's Court (*Curia Regis*) in its wanderings over the kingdom, but should be held in a fixed place (Magna Charta, 1217, s. 17). The rapid rise in power and influence of the court held by the King in person, or by his judges who attended him, combined with the necessity of bringing all causes, whether of a public or private nature, to the attention of a constantly moving court, constituted, for private suitors, a grave abuse. This was remedied by definitely establishing at Westminster, under the provision of the charter above referred to, a sufficient number of justices and barons of the King's Court to hear the private causes (common pleas) which could not conveniently follow the royal progresses. From this beginning down to the reform of the English judicature in 1875, the Court of Common Pleas at Westminster, as it was commonly called, shared with the Court of King's Bench the greater part of the common-law jurisdiction of England.

As distinguished from the King's Bench, the Court of Common Pleas was, as its title would seem to suggest, the popular and common court of the kingdom, having exclusive jurisdiction in all real actions, or suits relating to land, and in actions between private persons to try private rights; while the King's Bench was, for a long time at least, limited to pleas of the Crown, i. e. public causes, and appeals from county courts and other inferior jurisdictions. This division of business threw upon the Common Bench the great mass of litigation, so that Sir Edward Coke called it 'the lock and key of the common law,' and Sir Orlando Bridgman described it as 'the common shop for justice.' The court was

composed of a chief justice and as many common (or *puisne*) justices as the business of the court required. The number of these varied at different periods from four to eight. It was abolished by the Judicature Acts, 1873-75. See CURIA REGIS; COURT; EXCHEQUER; KING'S BENCH. The origin and history of the English courts of justice are concisely and accurately described by Inderwick, *The King's Peace: A Historical Sketch of English Law Courts* (London and New York, 1895).

COMMON PRAYER-BOOK. See PRAYER-BOOK.

COMMON RECOVERY. At common law, a mode of alienation, or process for conveying land, through the medium of a fictitious suit in the superior courts of law. There is no reason to doubt the tradition, to which Blackstone has given the weight of his authority, that this method of conveyance was "invented by the ecclesiastics to elude the statutes of mortmain." Being incapable of taking land by feoffment or deed, there was nothing to prevent them from bringing a suit for the recovery of the land of a collusive donor, alleging that the title was in them, and if he, thereupon, made default, the judgment of the court in their favor operated to vest the title conclusively in them. In form it was a judicial determination that they were the owners of the land as against the defendant. In effect it was a device for enabling the defendant to transfer his interest in the land to them. Blackstone says, further, that after the invention of common recoveries they "were encouraged by the finesse of the courts of law in 12 Edward IV. in order to put an end to all fettered inheritances, and bar not only estates tail, but also all remainders and reversions expectant thereon." This refers to the famous struggle between the great landowners, seeking to tie up their estates in their families by entailing them on their issue and making them inalienable, and the lawyers and law courts, who aimed, in the interests of public policy, to defeat the attempt. The statute *De Donis Conditionalibus* (known also as the Statute of Westminster II.), enacted by Parliament in 13 Edward I. (1285), provided that lands given to a man and the heirs of his body, known as conditional gifts, should not be alienable so as to defeat the inheritance of the issue therein nor so as to cut off the interests of those to whom the estate was to go upon the failure of such issue.

Several devices were tried to avoid the statute and break entails, but none of them was entirely successful until the year mentioned by Blackstone, 12 Edward IV. (1473), when, in the famous 'Taltarum's Case,' a common recovery was employed for the purpose. This proved to be entirely successful in barring the claims of the heir upon whom the lands were entailed, and, by a subsequent development of the action, all remainders and reversions dependent upon the fee tail were also cut off.

The process was too difficult and technical to be set forth at length here, but it may be briefly described as a collusive and fictitious suit, instituted by the person to whom the fee was to be conveyed (called the demandant) against the one who desired to bar the entail and convey the land (known as the tenant), by suing out a writ called a *precipe quod reddat*, in which the de-

mandant alleged that the tenant had no legal title to the land and that he, the demandant, had been turned out of it. The tenant defended the suit, but at a subsequent stage of the proceedings—which were in part conducted in open court—disappeared and had judgment rendered against him by default, and the lands were thus 'recovered' by the demandant. This recovery, being a supposed adjudication of the rights of the parties, bound all persons and vested a free and absolute fee simple in the recoveror. The process was known as 'suffering a common recovery.' A similar but less difficult and somewhat less efficacious proceeding was known as 'levying a fine.' The fine was by statute, in the reign of Henry VIII., substituted for the more cumbersome and expensive common recovery as a means of barring entails, and both have now been superseded by simpler and more modern conveyances. Recoveries were occasionally employed in the early history of some of the United States, but are now everywhere obsolete, and in some States expressly abolished by statute. See FINE; COMMON ASSURANCE; CONVEYANCE; TITLE. The common recovery is fully described by Blackstone, *Commentaries on the Laws of England*, bk. ii., chap. 21. See also Pigot, *Treatise of Common Recoveries, Their Nature and Use* (Dublin, 1792); Digby, *An Introduction to the History of the Law of Real Property* (5th ed., Oxford, Eng., 1900); Leake, *Elementary Digest of the Law of Property in Land* (London, 1874).

COMMONS. A name given to meals provided in English colleges and inns of court for their members. It is used occasionally in the United States for the college dining-room when that is under college control.

COMMONS, HOUSE OF. See PARLIAMENT.

COMMON SCHOOLS. Since instruction has, at least in modern times, been provided for the great majority of the people, the term common schools implies that the schools are for the masses of the people, or, where class distinctions are drawn, for the common people. The term, as used in the United States, implies, as well, that such schools are supported and controlled by the people and charge no tuition. The latter characteristic is now true for the most part of the common schools of Europe. The details of all such systems of schools are given in the article on NATIONAL EDUCATION, SYSTEMS OF.

Previous to the beginning of modern history no people ever contemplated the education of the masses, though with most ancient peoples, as well as during the greater part of the Middle Ages, there were schools that provided the rudiments of education for a limited class. With the Greeks and Romans this class was not a special educational class, the priesthood, as with most other ancient peoples, but included all those entitled to full citizenship. At Athens the elementary schools were private, and taught gymnastics and music, the latter including reading and writing. At Rome the elementary schools were introduced at a much later date than at Athens, were also private, and gave instruction in reading, writing, and calculation. During the Middle Ages such educational efforts as were made were wholly under the auspices of the Church. Schools were established and maintained by the Church, chiefly by monastic orders (see MONASTICISM), until the Renaissance of the

twelfth century. After that time we find schools frequently controlled by the secular clergy. The mediæval schools were either singing or grammar schools. The former were the elementary schools, and were designed primarily for training boys to assist in the Church service. A rudimentary knowledge of reading, and often of writing, Latin, as well as instruction in singing, was given. Such schools were very numerous before the Reformation, and offered an opportunity for an elementary education in almost every community, of which both the peasantry and the poor could avail themselves.

Until the middle of the eighteenth century the common schools still remained almost entirely under ecclesiastical direction. Later they were secularized, and attendance made compulsory. This was first accomplished on a large scale by Prussia in the latter half of the eighteenth century. In France the system of public elementary schools under the control of the State has been developed since 1833. In Scotland common schools have existed very generally since the latter part of the seventeenth century, though it was not until 1872 that these were placed entirely under the control of the State and attendance made compulsory. English common schools on any extensive scale date from the opening of the nineteenth century, and only since 1870 has there been any concerted governmental effort toward building up a common school system.

In the United States common schools were early established in most of the Colonies. Often these were private schools taught by some woman as a means of support. They were consequently called, as in England, dame schools, or sometimes, from the place where held, kitchen schools. The early colonists, however, gave greater attention to the founding of secondary or grammar schools as being of more immediate importance in the education of a ministry, this forming the chief motive to an education with them. In 1643 Massachusetts required that every township containing fifty families should have a school for all the children, the tuition to be paid either by their parents or by general provision. While in New England such common schools became free in the sense of charging no tuition during the latter part of the seventeenth century, in most of the United States the free common school is a development of the second quarter of the nineteenth century. During and since that time the system of free common schools has been systematically extended throughout all the States and Territories, and the course of instruction has been greatly enlarged. As each State has control of its own schools, there is great variety in the details of their management, but the following leading principles are the same in all: (1) A system of graded schools, embracing primary, grammar, and high schools; (2) State superintendents, who determine by examinations the qualifications of the teachers and watch over the efficiency of the instruction given; (3) uniformity of text-books; (4) public examinations; (5) school libraries and illustrative apparatus, and in many cases text-books supplied at public expense; (6) improved construction and furnishing of school-houses; (7) access to the school for all children of suitable age; (8) normal schools for the training of teachers. Some of the States have funds to aid them in supporting their schools.

In the West these funds are generally large, arising from the sale of lands granted by the General Government, and, in some instances, also by the State. Such grants by the United States for school purposes amount to 68,000,000 acres, valued at more than \$100,000,000. Before the Civil War there was no general and well-ordered system of common schools in the Southern States. But in their new constitutions they have made provision for them, and are now pressing forward the work. In 1867 a National Bureau of Education (see EDUCATION, COMMISSIONER OF) was established by Congress for the purpose of collecting statistics and diffusing information on the whole subject, so as to aid the people of the United States in the adoption and support of the best school systems, and to advance in other ways the cause of education throughout the land.

While the Massachusetts school law of 1649 had a compulsory feature, no effective system of compulsory education was ever adopted in the United States before the reform in Massachusetts that resulted from the efforts of Horace Mann (q.v.). At present (1902), thirty States, one Territory, and the District of Columbia, have laws making education compulsory, either at a public or an approved private school. In 1899-1900 there were 15,341,220 children enrolled in the common schools of the United States, out of a total of 17,544,888 enrolled in all the schools. The enrollment in the common schools is about 69 out of every hundred children of school age. The average length of the period of attendance was 98 days out of a total length of 144.6 days for the school term. There were more than 421,000 teachers engaged in the common schools, and the total expense of such schools was \$213,000,000. See EDUCATION; NATIONAL EDUCATION, SYSTEMS OF.

COMMON SCOLD. One who, by the practice of habitual scolding, disturbs the peace of the neighborhood. Scolding, in itself, is not obnoxious to the law, and, so long as it is confined to the domestic hearth, it is *damnum absque injuria*, no matter how persistent and violent it may be. It is only when the practice is indulged in public and with such frequency and under such circumstances as to threaten a breach of the peace that it becomes a public nuisance and punishable as such. The common law took cognizance of the offense and resorted to various devices, mostly of an unpleasant nature, for the punishment of those convicted of it. Among these punishments were the stocks (q.v.), the ducking-stool (q.v.), and the branks (q.v.), the last named being, during the period of its application, the most efficacious. The practice of punishing common scolds survives, sporadically, in the United States, in some of which it is recognized in the penal statutes, but the punishment has been mitigated to fine and imprisonment. Consult the authorities referred to under the title CRIMINAL LAW.

COMMON SENSATION, or COMMON FEELING. A collective name for the sensations which make up our general sense of bodily health or ill health, well-being or ill-being. It includes e.g. the diffused sensations of the tactual sense: shuddering, shivering, tingling, tickling, creeping, goose-flesh, pricking, pins and needles; sensations which can, in many cases, be set up as

concomitant sensations to squeaking or sawing noises and the like. (See references under ANTI-PATHY.) It includes, further, dizziness (see STATIC SENSE); the sensations of muscular exertion and fatigue; and the muscular and organic pains. Indeed, on the theory that pain is aroused by over-intensive stimulation of any and every sense-organ (Wuudt, *Phys. Psych.*, 1893), pain would be, literally, a sensation 'common' to the whole sensitive organism. Sometimes the two sensations of temperature are called common or general sensations; and the alimentary sensations of hunger, thirst, and nausea, as well as the respiratory sensations of stuffiness, of a 'bracing' air, etc., are also covered by the term. It is clear that the phrases 'common sensation,' 'common feeling,' 'general sense,' belong to a psychology that had not yet succeeded in analyzing the more massive complexes of organic sensations, and in referring them to specific organs within the body. In the present state of our knowledge, there is no reason for their retention. Consult: Kuelpe, *Outlines of Psychology* (London, 1895); Titchener, *Outline of Psychology* (New York, 1899). See CUTANEOUS SENSATION.

COMMON SENSE. A pamphlet by Thomas Paine, published in Philadelphia, 1776, advocating the separation of the United States from England. It was thought of sufficient importance at the time to receive public notice from General Washington.

COMMON SENSE, THE PHILOSOPHY OF. There are certain beliefs that have been supposed to be current among men in all ages. Of these, a striking illustration is the belief in an external, material world, independent of any mind to perceive it. Other such beliefs are those in the validity of the laws of identity, contradiction, and the excluded middle, in the truth of the axioms of mathematics, in the universality of causality, and in the eternal obligation of morality. The philosophical acceptance of these beliefs as self-evident and beyond the reach of criticism is called common-sense philosophy. (See also DOGMATISM.) Thomas Reid (q.v.) was the most distinguished advocate of common sense as the final court of appeal on all matters philosophical, and he has been generally followed more or less closely by the philosophers of the Scottish School—James Beattie, Dugald Stewart, Sir William Hamilton, Henry Calderwood, and James McCosh. The untenability of this position is realized as soon as it is recognized that common opinion has often been shown to be mistaken. Nor will an appeal to 'an immediate deliverance of consciousness' do as a substitute for common sense, for an hallucination is as immediate a deliverance of consciousness as an ordinary perception is. Criticism is necessary for establishing the validity of every belief. (See KNOWLEDGE, THEORY OF). Consult: Seth, *Scottish Philosophy* (Edinburgh and London, 1890); McCosh, *Scottish Philosophy from Hutcheson to Hamilton* (London and New York, 1875); Sidgwick, "The Philosophy of Common Sense," in *Mind*, N. S., vol. iv. (London, 1895).

COMMON TIME. See TIME.

COMMONWEALTH OF AUSTRALIA. See AUSTRALIAN FEDERATION.

COMMONWEALTH OF ENGLAND. The official designation of the Government of Eng-

land from the abolition of the monarchy, February, 1649, until the establishment of Cromwell's Protectorate, December, 1653. The title is generally applied to the whole period dating from the death of Charles I., January 30, 1649, to the restoration of Charles II., May 29, 1660. See CROMWELL, OLIVER.

COMMUNE' (Fr., district, from ML. *communa*, *communis*, district, from Lat. *communis*, common). The smallest administrative division of France, and the unit of local self-government. The commune is a legal body, and can buy and sell property, contract debts, and appear in the courts. The chief magistrate is the *maire* (mayor), who is assisted by one or more deputies and a deliberative assembly, called the *conseil municipal*. The *maire* unites in himself two general classes of functions resulting from the twofold nature of the commune. As the agent of the National Government he is charged with the local promulgation and enforcement of laws and decrees; and, as a member of the municipality, he has to attend to the police, the revenue, and the public works of the commune, and in general to act as the representative of the corporation. In communes which rank as the administrative centres of a department, *arrondissement*, or *canton*, or which have a population of more than 3000, the *maire* is nominated by the Central Government; elsewhere the appointment is made by the prefect of the department. The councilors are elected by the votes of the communal electors, and hold office for five years.

COMMUNE. A term applied in feudal times to a body of burghers holding a charter granting them certain privileges of self-government. These communes were found in France, England, Italy, and elsewhere. On the character of these mediæval communes, consult Stubbs, *Constitutional History of England*, chap. xi.

COMMUNE OF PARIS (1792). The revolutionary municipal government established in Paris in August, 1792. It acquired immediate ascendancy in the Assembly, through the personal pressure its leaders could bring to bear, and as its power increased it became more and more the instrument of the violent element of the Revolution and dictated the policy of France. Its history became the history of the Revolution itself. On this commune, consult Morse-Stephens, *History of the French Revolution*, vol. ii.

COMMUNE OF PARIS (1871). This is commonly referred to when the term is used without qualification. It was the insurrectionary body, or organized mob, which was in possession and control of Paris from March 18 to May 27. The German army of occupation left Paris March 3, and almost immediately signs of revolt appeared. On the 18th the Reds, as the Communists were called, with the encouragement of the *Internationale* (q.v.), rose against the French regular troops, and, supported by the National Guard, took possession of the city. Generals Lecomte and Clément Thomas were shot. Communal elections were held and the authority of the National Assembly, which was sitting at Versailles, was declared null. Peace negotiations with Germany were held in abeyance until the new National Government could establish its authority in France, and it was intimated that Germany might find it necessary to reoccupy the abandoned fortresses. Large bodies of the French

prisoners held by Germany were released to reinforce the army at the disposal of the Government for the suppression of the insurrection. The army was thus raised to 150,000 men, and on April 6 active operations were begun by the Government forces, under Marshal MacMahon, for the capture of Paris. The military administration of the Commune was notoriously incompetent, and insubordination and debauchery rendered the forces inefficient, but the available number of the National Guard approximated 100,000, and they were well armed and possessed strong fortifications, the reduction of which was not a light task. The siege of the city was pushed with energy, for the credit of the new Republican Government of France before the world hung upon its ability to maintain its authority. Before the middle of May it became evident that the Commune could not hold out much longer, and its followers began to resort to acts of vandalism. The residence and library of Thiers were destroyed, May 10; the Vendôme Column was pulled down, May 16. The Government forces penetrated the defenses of the city on May 21, obtaining possession of Montmartre on May 23, and now was enacted that saturnalia of violence and crime which has made the name of the Commune infamous. On May 24 the Communists set fire to the public buildings, the Palace of the Tuileries being destroyed. On the same day a large number of hostages, including M. Darboy, Archbishop of Paris, were massacred. On May 27 the last hand-to-hand struggle, without quarter, was fought in the Cemetery of Père-la-Chaise. On the following day all resistance came to an end, and the reign of the Commune was closed. Many of its leaders were put to death, others were punished with banishment or imprisonment. Most of the banished were pardoned in 1880. The Communal Council, the governing body of the Commune, was organized in ten committees, of which that for finance was the most efficient. At the head was a general executive committee, the authority of which was never great. It was displaced by a committee of public safety, which was expected to exercise dictatorial power, like its Revolutionary prototype; but this, too, proved a failure. The Commune was essentially lawless. Many of those who initiated the movement were honest theorists and enthusiasts, but the forces they called into action were entirely beyond their control. There is no scientific history of the Commune. The principal work is du Camp, *Les convulsions de Paris* (4 vols., Paris, 1878-79), conservative. Of Communist sympathies are Arnould, *Histoire populaire et parlementaire de la Commune de Paris* (3 vols., Brussels, 1878), and Lissagaray, *Histoire de la Commune* (last edition, Paris, 1896); there is an English translation by Aveling of an earlier edition (1886). Consult also Washburne, *Recollections of a Minister to France* (2 vols., New York, 1887); Simon, *The Government of M. Thiers* (2 vols., New York, 1878); Fetridge, *Rise and Fall of the Paris Commune of 1871* (New York, 1871); March, *History of the Commune of 1871* (London, 1896). See FRANCE; FRANCO-GERMAN WAR.

COMMUNICATIO IDIOMATUM (Lat., communication of peculiar properties). A term of ancient, and more particularly of Lutheran Christology, denoting that each of the two natures of Christ, divine and human, imparts its

peculiar properties to the other, so that they become similar, each having as a derived property what the other has as original. Consult Thomasius, *Die Christliche Dogmengeschichte*, ii. (Erlangen, 1874-76). See CHRISTOLOGY.

COMMUNION (Lat. *communio*, participation, from *communis*, common). In ecclesiastical language, that relation, involving mutual claims and duties, in which those stand who are united by uniformity of belief in one religious body or church. To exclude from this relation and its involved rights is to *excommunicate*. The most visible symbol of this relation being the partaking together of the Lord's Supper, that rite is often called the Communion. See LORD'S SUPPER; and, for communion table, ALTAR.

COMMUNION IN BOTH KINDS. A term of theology, implying that, in the celebration of the Lord's Supper, communicants partake of both the bread and the wine. It is universally acknowledged that in the Primitive Church both the bread and the cup were distributed to all who communed. Sects which, like the Manichæans, discarded the wine, were condemned as irregular. Early popes commanded the use of both kinds (e.g. Gelasius I., 492-496). As, however, there was frequent occasion to carry the consecrated elements from the church to sick persons at their homes, it became customary, for convenience, to dip the bread in the wine, administering, in this way, both in one. At length it was thought more convenient to omit the wine. In the thirteenth century, Robert Pulleyn, of Oxford, approved the custom of giving to the laity the bread only, in order, as was said, to avoid the danger of spilling the wine. This view was adopted by the scholastic theologians, who taught that Christ was wholly present in the sacrament under either form, and that, consequently, one form was sufficient for a valid observance of it. Thomas Aquinas and Bonaventura, especially, advocated the administration of the communion under one form only. As this view predominated in the course of time, it became the practice of the Church in the West to withhold the cup from the laity. Against this the heretics of the Middle Ages, as the Waldenses, and especially the Hussite sect of Calixtines (Utraquists), protested. The Protestant churches, also were united in regarding the communion in both kinds as essential to the right observance of the ordinance. The practice of the Roman Catholic Church was confirmed and made binding by the Council of Trent in 1563. It is defended on the ground that the cup is not necessary to the completeness of the sacrament. Since the whole Christ, as to His body, soul, and divinity, is not only in each species, but in every particle of both, he who receives the consecrated bread receives the whole Christ. But while this law is uniformly enforced in the Western Roman Catholic Church, those portions of the Eastern churches that acknowledge the supremacy of the Pope are allowed to retain both forms; and the same toleration has been offered to Protestants in order to facilitate their return into the unity of the Church under the Roman See. See LORD'S SUPPER.

COMMUNISM (Fr. *communisme*, from *commun*, joint, common, from Lat. *communis*, common). A system of society in which private

property is abolished and all goods are held in common, the needs of each individual being supplied from public sources. It is unfortunate that no clear distinction is made between communism and socialism. The socialists are carrying on a political agitation which may or may not lead to communism. Communists usually in theory, always in practice, have withdrawn from the general life into separate communities and then followed their plans. It is probably correct to say that communism is the radical wing of socialism. Communism should not be confused with the so-called French Communists of 1871, who were seeking political changes in the *communes*.

A great deal of unwarranted reproach has been put upon communism either through ignorance or because of vagaries attached to many plans for its realization. It is really a reaction against the evils which have, hitherto, at least, always accompanied private property. In reality, too, it is older than the present system. All historical nations, so far as known, at one time held their land in common, the individual having only the use of a portion of it for a certain period. A survival still exists in the Russian *Mir*. Cultivated land seems first to have become private property, the meadows and forests remaining common.

In ancient Greece the evils of private property called forth many suggestions of another system. These were ridiculed in the popular comedies of the day. The most famous of the proposed systems is that made by Plato, in the *Republic*. Private property and private families are the chief influences tending to exalt the welfare of the individual over that of the State. Dispense with these, put men and women on equal footing, and let fitness be the test for positions. Let the children be educated by the State. Plato never conceived of a democracy. He could not conceive of a State without slaves; these formed the substratum of his *Republic*. Plato, however, appreciated that his plan was ideal and would not be realized. His scheme went contrary to the spirit of the times and aroused only discussion. The proposal for the abolition of the private family seems to coincide with the ideas of other writers. Turning from speculative Greece to Rome, we find no such ideal proposals. Individualism was too strongly entrenched.

In the East, however, there was a different spirit. In Palestine, the Essenes and Therapeutæ held property in common, and Josephus (*Antiq.* xi., 8. 3) says that one joining the Essenes had to surrender his private property. Much is said about the communism of the early Christians. A certain degree of it existed, but it seems to have been purely voluntary, many Christians retaining their private property. In any case, the institution did not long endure. The ascetic tendencies which often manifested themselves in communistic forms among heretical and orthodox sects were introduced into the West from the East. The Manichæans believed that matter was evil. Before an inquisition at Turin in 1030 a heretic declared: "We hold all our goods in common with all men." Other heretical sects, the Catharists (eleventh century) and the Apostles (thirteenth century), held similar views. The Brothers and Sisters of the Free Spirit held that, before the Fall, men were like God, that Paradise must be reintroduced with

community of goods and of women. Many evil stories are told of their proceedings, and they were opposed by the Inquisition, but spread in secret during the fourteenth and fifteenth centuries. With these may be compared the Adamites of the fifteenth century. The great monastic orders bear close resemblance in their common property.

During the fifteenth and sixteenth centuries the Taborites (Hussites), the Moravians, and the Anabaptists arose and flourished in succession in central Europe. (For detailed descriptions, the reader is referred to separate articles under these heads.) The teachings of the Anabaptists (q.v.) were embodied, in Thuringia, in a popular movement to realize a State without government, law, or property, each to receive according to need, 'omnia simul communia.' This and the attempt at Münster to establish the new Zion were forcibly put down. As it was impossible to establish communities in secret, efforts were directed toward marriage reform. These naturally led to opposition and suppression. All of these plans grew out of, or were impelled by, distorted religious conceptions. As moral and religious movements they must be judged rather than as economic undertakings. They were overthrown by religious opposition. They had no chance to demonstrate the practicability or possibility of their proposed life.

In the next era we find a group of dreamers, theorists who prophesied a better system to supplant the present, which they felt to be unjust. How far these writers believed their systems could be realized in the near future is a question. Most of them rather try to portray the ultimate form which society shall assume. Some, however, have tried honestly and earnestly to realize their aspirations. However impracticable and visionary their proposals may seem, they are proposals, not of self-seekers, but of those who have the welfare of society at heart. As such they merit consideration.

The opening up of America made possible genuine attempts to found communistic settlements which should not be overthrown by sectarianism, but should have abundant opportunity under favorable conditions to prove or disprove their fitness to exist. Most have failed, and the reasons are usually plain. Mismanagement being left out of consideration, society cannot found itself upon such a basis as celibacy, nor, on the other hand, upon 'free love.' Nor does it seem likely that society will be regenerated by groups who isolate themselves from the common life. The strength and dignity of the life of some of the communities may well, however, stimulate all men to renewed efforts to realize the best for themselves and society.

THE UTOPISTS. The publication of *Utopia* by Sir Thomas More (1516) introduced a new element. He wished nothing of an ascetic nature, but sought a fuller and freer expression of life. His book arose from the economic changes taking place in England. The introduction of sheep-raising was destroying the small farms and bringing much suffering to the peasants. More, influenced by Plato, proposed to retain slavery, the slaves being chiefly convicted criminals. There should be community of goods: every one should be supplied from the State storehouses. Monogamy is prescribed, and the greatest freedom allowed the individual families. Men and

women are to work six hours per day. The title 'Utopia' has given the name to all such proposals. More has been followed by many writers. Campanella (*Civitas Solis*, Frankfurt, 1623) advocated community of goods and of women with universal duty to labor four hours a day, each person to be provided according to need. Vairasse (*Histoire des Sercrambes*, 1677) proposed an eight-hour working day. Among the most interesting Utopistic efforts is the charming story by Cabet, *Voyage en Icarie* (Paris, 1842), in which monogamy is preserved, each person working according to ability and receiving an equal reward. Cabet's pathetic attempts to realize his dreams will be mentioned later. Bellamy (*Looking Backward*, Boston, 1888) advocated wages in the form of annual credits at the public warehouse, at which goods are sold according to the quantity of labor required in their production. Hertzka (*Freiland*, Leipzig, 1890) and Sheldon (*In His Steps*, Topeka, 1899) may also be classed here.

In the meantime there arose many critics of existing conditions who proposed communistic remedies. Meslier (1664-1792) in his *Testament*, first published in Amsterdam in 1864, viewed society as a product of force and its evils as the results, largely, of private property. The various parishes should form large families bound mutually to assist each other; each individual to have according to his needs. Morely (*Code de la Nature*, Paris, 1755) advocated communities of about 1000 persons with common goods and distribution according to need.

These and other men found little acceptance, but the reaction of the French Revolution brought results. Saint-Simon, whose influence was in his personality rather than his writings, proclaimed the control of the 'Industrielles.' Property reform did not greatly concern him. His system was to be religious and moral, a 'new Christianity.' The occupation of each person was to be decided by the directing authority, the remuneration to be by salary proportioned to merits of the work and the individual. (See SAINT-SIMON.) Of the French communists, Charles Fourier (q.v.) probably had the greatest influence. He did not advocate abolition of private property, but believed in associations of 2000 people who should live in a 'Phalanx,' work and consume in common so far as pleased them, but who were by no means to be equally interested financially or to share equally in proceeds. Strictly speaking, Fourier's scheme might be called a cooperative corporation save for its features of common life. Buchez (1831) advised that laborers save enough to start productive associations. Louis Blanc developed this idea, saying that the State should assist the laborers in founding 'ateliers sociaux.' These would gradually overcome the capitalistic system and lead to communism.

At this time, in England, Robert Owen had become very prominent by his works and his teachings. Owen came to his ideas not by way of pure speculation, but felt himself driven by the logic of the situation in which he found himself. He was a successful manufacturer interested in his employees. He finally advocated the forming of groups of from 500 to 1000 persons, who should provide themselves all the necessities of life. The members should live in great houses surrounded by gardens, and all artificial distine-

tions between men should be thrown down. Such colonies would prove so attractive that the existing industrial system would break down because of the desertion of the workmen. In 1819 it was attempted to start such a colony at Motherwell, but the funds were not sufficient. In 1824 Owen came to America, where his presence did much to start a wave of communistic thought, and where some twelve colonies were planted, none of which lasted more than a few years. During his absence (1826) some of his friends purchased 291 acres of land at Orbiston, near Glasgow, and built a large building in which all should live, each sharing in the division according to his labors. The death of one of the founders, with other difficulties, brought an end to the plan. Similar colonies at Rahaline in the thirties and Queenswood (1841) likewise failed, the latter after five years' existence. Owen's attempts to realize communism were not successes; he did succeed, however, in establishing coöperation. (See OWEN, ROBERT.) Other notable attempts along the same line were made in England by Charles Kingsley and Thomas Hughes, to whose biographical notices in this work the reader is referred.

COMMUNISM IN AMERICA. The centre of interest in communism is henceforth in America. One of the provisions in the 'oldest American charter' (1606) was that there should be a common storehouse in which the products should be kept, and from which each should receive according to his needs. Jamestown lived under this scheme for five years, the idlers giving Capt. John Smith much trouble meantime. The Pilgrims had similar arrangements, which were soon changed, but for a long time much land was held in common. Of this custom Boston Common is a survival. These arrangements were but temporary, however. In 1774, driven by religious opposition, 'Mother Ann Lee' came from England with a small company of Quakers, who were called Shaking Quakers because of certain physical movements in religious exercises. The name was soon shortened to Shakers. They settled at Watervliet, near Albany, N. Y. Mother Ann died in 1784. In 1787 a covenant was adopted establishing celibacy and community of goods. Their communism grew out of their religion. Christianity, they say, does not admit of divisions into rich and poor; 'mine' becomes 'ours,' and riches and poverty, with their misery, disappear. The Shakers have lived happily and contentedly and have had great material prosperity. Says Professor Ely: "Economically the Shakers have been a great success." They have now some seventeen societies in different States, the largest being at Mount Lebanon, N. Y. They own some very valuable property. (See SHAKERS.) The Harmonists, or Separatists, as they were called in Germany, left the Fatherland because of sectarian opposition and settled in 1805 at Harmony, Pa., under the leadership of George Rapp. They, too, have been very successful financially. At one time they had a thousand members, but now only forty or fifty remain. They are obliged to employ outsiders to carry on their enterprises, so that they have practically become a close corporation. See HARMONISTS.

The Amana Community of seven villages in Iowa was founded by another German sect, the *Inspirationists*, who settled near Buffalo, N. Y., in 1842, moving to Iowa in 1855. Religion is

the primary thing. Yet they have prospered and possess fertile and well-improved lands. They number 1800 or more. Marriage is permitted. In 1844 yet another German sect settled at Bethel, Mo., moving later to Aurora, Ore. They have been fairly successful. (See AMANA.) The French in 1848 under Cabot, who tried to establish Icaria, were not successful. After many discouragements and disappointments they were finally settled in Iowa. Trouble followed trouble, and the end came in 1895. See ICARIANS.

All of these communities were started by foreigners, though most of the Shakers have been Americans. An American colony of some fifty members was started by John Humphrey Noyes in 1847 at Oneida, N. Y. Later a small branch was established at Wallingford, Conn. They believed in freedom from sin and were called Perfectionists (q.v.). Between 1840 and 1850, under the leadership of Albert Brisbane, Horace Greeley, Charles A. Dana, and others, Fourierism spread over the country, Greeley advocating it in the New York *Tribune*. Some thirty-four 'phalanxes' were started in various places, most of which were short-lived. The most famous was Brook Farm (q.v.), near Boston, which began as a coöperative school. The North American Phalanx, in Monmouth County, N. J., was the most successful, lasting some twelve years (1843-56). Ripon, Wis., dates back to the Wisconsin Phalanx of 1844. This association paid \$1.08 on the dollar when it dissolved. The movement gradually subsided.

In recent years a number of attempts to found communistic settlements have been made, but they have broken down largely because of internal dissensions. Among these may be mentioned Kaweah, in California (1884); Topolobampo, Mexico (1886); and the Ruskin Coöperative Colony, in Tennessee (1893). The only recent European settlement was an attempt in 1895 to realize the ideals of Hertzka's 'Freiland' in Africa. The reason for the failure of many of these enterprises is not far to seek. Lack of unity of purpose and unwise management bring sure destruction. Fourierism was a compromise. It retained gross inequalities while condemning those of the world. It was not a unifying principle. On the other hand, those which have succeeded have possessed just this unity—usually in adherence to some social or religious ideal which has made the interests of the individual the interests of the group. That material prosperity has accompanied this unity history clearly shows. The social life of the Shakers and of the Amana Community has always deeply impressed the visitor from the outside world. Howells in his *Undiscovered Country* tells of their life and makes one of his characters say, "They're what they seem; that's their great ambition." In his autobiography, Horace Greeley wrote of the Shakers: "No one will pretend that they have failed. No; they have steadily and eminently expanded and increased in wealth and every element of material prosperity, until they are at this day just objects of envy to their neighbors. They produce no paupers; they excrete no beggars; they have no idlers, rich or poor; no purse-proud nabobs, no cringing slaves. If there were no other success akin to theirs—but there is—it would still be a demonstrated truth that men and women can live and labor for general, not selfish, good—can banish pauperism, servitude, and idle-

ness, and secure general thrift and plenty by moderate cooperative labor and a complete identity of interests." No more fair and judicial view of communism has been presented than John Stuart Mill gives in his *Principles of Political Economy*. Mill recognizes the evils of private property and the desirability of remedying them. He notices the difficulties of communism, that men would evade work, that it would be hard to make a fair distribution of work. He raises the question as to whether communism gives greater freedom and liberty to the individual. The statement is summed up in: "It is yet to be ascertained whether the communistic scheme would be consistent with that multiform development of human nature, those manifold unlikenesses, that diversity of tasks and talents and variety of intellectual views which not only form a great part of the interest of human life, but by bringing intellects into a stimulating collision, and by presenting to each innumerable notions that he would not have conceived of himself, are the mainspring of mental and moral progression."

The experience of the last century is of great value. The social and economic fruits endure though the individual communities have gone. The questions of Mill have not all been answered in the affirmative nor yet in the negative. Most of the features of many of the experiments to which exception is taken—free love, celibacy, and the like—are not essential features. Private property has its evils, but it has been a powerful incentive to progress. Will communism give an equal incentive without the evils? The tendency to-day is away from the formation of isolated groups. In the middle of the last century many able and intelligent men thought to reform the world in a few years. Cabet allowed fifty years for a preparation—then complete communism. Such dreams have largely vanished. The settlements have seemed to furnish little scope for ambition, and ambition is one of the chief traits of mankind. The socialists and all who may hope for communism are now seeking it by the way of gradual political reform. In summing up American communism, Professor Ely says: "It has accomplished much good and little harm. Its leaders have been actuated by noble motives, have many times been men far above their fellows in moral stature, even in intellectual stature, and have desired only to benefit their kind. Its aim has been to elevate man and its ways have been ways of peace."

BIBLIOGRAPHY: Consult: Kautsky, *Communism in Central Europe at the Time of the Reformation* (London, 1897); Kleinächter, *Die Staatsromane* (Vienna, 1891); Stammhammer, *Bibliographie des Sozialismus und Kommunismus* (Jena, 1893-99); Stegman-Hugo, *Handbuch des Sozialismus* (Zurich, 1897); Ely, *French and German Socialism* (New York, 1883); Nordhoff, *The Communistic Societies of the United States* (New York, 1875); Ely, *The Labor Movement in America* (2d ed. New York, 1890); Noyes, *History of American Socialism* (Philadelphia, 1869); Shaw, *Icaria* (New York, 1884). See SOCIALISM.

COMMUNISTIC SOCIETIES. Social, and frequently, religious associations based on the general principle of each member contributing all his possessions, labor, and earnings to a common stock, in which all members share alike. As

is pointed out more fully in the article COMMUNISM (q.v.), such expedients have been adopted for the benefit of groups of individuals throughout the entire course of history. In central Europe, during the Reformation, numerous communistic organizations sprang up, notably the Taborites (q.v.) and their successors, the Moravians (q.v.). Later the teachings of Fourier and Saint-Simon on the Continent and Kingsley and Hughes in England stimulated like movements. During the past century the United States has been the scene of nearly all communistic organizations, a new country furnishing the best field. They characterize that stage in social evolution during which men are forced to group together into communities in order to provide for their mutual wants, and disappear with the appearance of more complex division of labor and more advanced social conditions. The more important modern communistic societies are treated elsewhere under separate titles. See KORESHIAN ECCLESIA; SEPARATISTS; SHAKERS; PERFECTIONISTS, etc.

Of the lesser communistic societies may be mentioned: (1) The *Adonai Shomo*. This society was organized and incorporated in Petersburg, Mass., in 1876. Its religious principles are like those of the Adventists, among whom the movement originated. The communistic system is added, with recognition of an equal voice to men and women in the management. The society ceased to exist in 1897. (2) The *Altruists*. This society is non-sectarian and does not interfere with marriage or the family affairs of its members, or with their opinions. Men and women are accorded equal rights, and the governing body is chosen by the vote of the majority. (3) The *Amarna Community, or True Inspiration Congregation*. The first members of this society came from Germany, led by Christian Metz, of Strassburg, and founded the Community of Eben-Ezer, near Buffalo, N. Y., in 1842. Between 1855 and 1865 they gradually removed to their present location, near Davenport, Iowa. They have no creed but the Bible, believing in its entire inspiration, that God still inspires His people and that their leaders for the time being are possessed by this gift. They hold the doctrines of the Trinity, justification by faith, the resurrection of the dead, and purification of the wicked by fire, but not that of eternal punishment; are non-resistants, and approve of marriage. Members are classified as of the highest, middle, and children's orders, to the last of which those of the higher orders who fail are dropped till they amend. An examination of the spiritual condition of all the members is held at least once a year. Their regular religious services include singing, reading from the Bible and the inspired book, prayer, and exhortation. Temporal affairs are administered by a board of trustees chosen by the members, to which women are not elected.

COMMUNITY OF PROPERTY. In law, a condition under which property is held, having its origin in the civil law, whereby a sort of partnership or common ownership of property is created between husband and wife. It covers all personal property owned by either party before marriage or acquired during marriage, all realty and all profits and rents acquired or accruing during marriage. Property given to either by deed of gift in which the donor spe-

efically makes it the exclusive property of the donee is exempt from the operation of the doctrine. The survivor takes one-half the property after their joint debts are paid, and also has certain homestead rights. The heirs of the deceased spouse take one-half the common property remaining after the payment of debts, subject to the survivor's homestead rights, if there is no real property. This doctrine was introduced from the French and Spanish law into many of the Western States, including Louisiana, but is generally regulated and somewhat modified by statutes. (See HUSBAND AND WIFE; GANANCIAL SYSTEM.) The expression community property is sometimes used to describe the holding of property in common by communistic societies, such as the Shakers. In such communities there is a sort of general partnership in all property, each adult individual owning an equal share by virtue of his membership. The ownership is in the nature of a tenancy in common, and is not subject to the rules of the civil law above described.

COMMUTATIVE LAW. See ASSOCIATIVE LAW.

COMMUTATOR. See DYNAMO.

COMNENUS (Lat., from Gk. Κομνηνός, Κομνηνός). The name of a family, originally from Paphlagonia, of which several members occupied the throne of the Byzantine Empire, from 1057 to 1204, and that of Trebizond, from 1204 to 1461. After the fall of Constantinople one branch of the family settled in Saxony, another in Corsica; but the attempt which has been made to trace the descent of the Bonaparte family from a branch of the Comneni is not supported by valid evidence. See ALEXIS; ANNA COMNENA; BYZANTINE EMPIRE.

COMO (Lat. *Comum*). The capital of the province of the same name in north Italy, situated at the southwestern end of Lake Como, at a distance of 28 miles by rail from Milan (Map: Italy, D 2). The surrounding country is of great picturesqueness. The city is surrounded by hills covered with gardens and groves and contains some buildings of considerable architectural merit. The marble cathedral belongs to different periods and is built in different styles. It was begun in the Gothic at the end of the fourteenth century; the larger portion was constructed in the Renaissance style, mostly by Rodari during the fifteenth century, while the dome is of relatively recent origin. The interior is decorated with rare pictures and monuments; in the main entrance are placed two statues of Pliny the Elder and the Younger, both of whom were born at Como. The Basilica of Sant' Abbondio, a building of Lombard origin, rebuilt in the eleventh century and recently restored, is of great artistic value. The Church of Santissima Annunziata, situated on the promenade outside of the town, is remarkable for its rich decorations of marble and gold. Adjoining the cathedral is the city hall, a large, arched structure, built of different-colored stone, and completed in 1215. Other noteworthy buildings are the theatre, built in 1813; the lyceum, founded in 1824; and the city museum, with its collections of Roman antiquities, arms, and coins, opened in 1897. Como has extensive manufactures of silk, velvet, and knit-ware. The commerce is also of considerable importance.

The ancient Comum was a city of the Insubres, occupied by the Romans in B.C. 196, and colonized by Cæsar as a military post to repress the Alpine tribes. In the Middle Ages it was a stronghold of the Ghibellines and the 'open door of the emperors into Italy.' In 1127 it was destroyed by the Milanese, and rebuilt by Frederick I. in 1159. Later it was ruled by the Rusca family, and in 1335 came into the possession of the Visconti, from which time it shared the fortunes of Milan. In 1859 it was a centre of the agitation headed by Garibaldi.

Como is the seat of a bishop and the birthplace of Innocent XI. and Clement XIII., the historian Giovinio, and Volta. Population, in 1881 (commune), 25,560; in 1901, 38,895.

COMO, LAKE. (It. *Lago di Como*, or *il Lario*, Ger. *Comer See*, anc. *Lacus Larius*, praised by Vergil (Georg. II., 159). The most beautiful and celebrated of the Italian lakes, situated in Lombardy, at the western foot of the Bergamese Alps, 30 miles north of Milan (Map: Italy, D 2). Its elevation is 650 feet; its area, about 60 square miles; its greatest length, 30 miles; its greatest width, not quite 3 miles; and its greatest depth, 1340 feet. The southern part divides, at Bellaggio, into two arms—the eastern called Lake Lecco, the western retaining the name Lake Como, and having the city of Como (q.v.) at its extremity. Between these two arms lies the fruitful district of Brianza. The river Adda enters the northern end of the lake, and leaves at the southeastern extremity, near the charming town of Lecco. The beauty of Lake Como, with its rich shifting, marvelous colors, and its picturesque mountains (7000 feet), clothed with the vivid green of the chestnut, varied with the delicate gray of the olive, has long been extolled. The cypress, aloe, laurel, myrtle, and oleander add their effects to the luxuriant landscapes which are embellished by numberless costly villas, with gardens, terraces, and vineyards, of distinguished or wealthy families that have been attracted from many countries by the delightful region and the indulgent climate. The lake is especially the resort of the Milanese aristocracy. A number of the villas, possessing worthy art collections (including particularly several fine examples of Thorwaldsen and Canova), are opened regularly to visitors. The most attractive towns on the lake are Cernobbio, Tremozzo, Cadenabbia, Menaggio, Bellano, and Bellaggio, the loveliest point on the lake. The steamboat service is excellent. The industrious inhabitants along the shores are chiefly engaged in silk production and manufacturing. Fish are plentiful and of many varieties. The artistic articles made of olive wood and offered to the tourist at Bellaggio are well known.

COMONFORT, kō'mōn-fōrt', IGNACIO (1812-63). A Mexican statesman. He was a member of Congress in 1842, and a Senator six years later. In 1854 he assisted Alvarez against Santa Anna, and, on the latter's abdication (1855), became Provisional President. He was proclaimed President in 1857, but in 1858 was driven into exile. In 1863 he commanded an army to oppose the French invaders who intended to establish the Emperor Maximilian in power, was defeated by Bazaine near Cholula, and shortly afterwards was killed in an ambush by bandits.

COM'ORIN. See CAPE COMORIN.

COMORN, kó'mörn. See KOMORN.

COM'ORO ISLANDS. A group of four large and a number of smaller islands in the Mozambique Channel, midway between Africa and Madagascar, lying between latitudes 11° and 13° S., and longitudes 43° and 45° 30' E. (Map: Africa, J 6). The four larger islands are Comoro, Johanna, Mohilla, and Mayotta, the last of which, while belonging geographically to the Comoro group, has not usually been included with them. They have a total area of 760 square miles. They are of volcanic origin and mountainous; the highest peak rises to 8700 feet. The soil is fertile and produces fruits and some sugar. Cattle are also raised to some extent. The manufactures are coarse cloths, jewelry, and cutlery. The island of Mayotta was ceded to France in 1842, and the remaining ones added in 1886. They are a dependency of Réunion, and are ruled by native sultans, who are under the supervision of French Residents. The population is estimated at over 60,000, of mixed Arabic and negro descent, professing Mohammedanism.

COMPAGNI, kóm-pä'nyé, DINO (? -1324). A Florentine historian and statesman of the fourteenth century. He was long believed without question to be the author of a history of Florence from 1280 to 1312 (*Cronaca delle cose occorrenti ne' tempi suoi*). In 1858 Fanfani's *Piovano Arlotto* cast doubt upon the genuineness of the chronicle, and in 1874 P. Scheffer-Boichorst's *Florentiner Studien* sought definitely to prove its spuriousness. A paper war was waged over the matter, some maintaining that the work is wholly spurious, others that it is wholly genuine, while a third party contended that it is in the main genuine, but is in parts disfigured by later interpolations, abbreviations, and changes. Since the appearance of Del Lungo's *Dino Compagni e la sua cronaca* (1879-87), the last-named has been the generally-accepted opinion. Symonds (*The Age of the Despots*, London, 1875) dismisses the question in a foot-note, and thus characterizes Compagni and his work: "He was a man of the same stamp as Dante. . . . He undertook to narrate the civic quarrels of his times, and to show how the commonwealth of Florence was brought to ruin by the selfishness of her own citizens; nor can his 'Chronicle' be surpassed for the liveliness of its delineation, the graphic clearness of its characters, and the acute analysis which lays bare the whole political situation."

COMPANION (Dutch *kompanje*, Fr. *compagnie*, company, crew; influenced in popular etymology by Eng. *companion*, comrade). The skylight or cover to quarter-deck hatches through which the light passes to the deck below. Companions are usually removable. With the disappearance of old-fashioned ships, the name has fallen into disuse. The *companion ladder* is the ladder leading from the quarter-deck to the deck below, and the *companion-way* is the hatch (together with its deck-house, if there be any) through which the companion ladder leads.

COMPANY (from Fr. *compagnie*, OF. *compagnie*, It. *compagnia*, from Lat *com-*, together + *panis*, bread). A number of persons associated together in a joint enterprise, usually of a mercantile character.

CHARTERED COMPANIES. As a legal term, 'company' was first employed in connection with the great chartered companies of the period of adventure and exploration in England during the fourteenth to the seventeenth century. The essence of these companies was the possession of certain exclusive privileges conferred by royal charter, either a monopoly of trade with certain countries or regions of the earth, or more or less extensive power of colonization and government; or, as was usually the case, a combination of the two. These companies were of two distinct types, viz.: the trading company, to which individual merchants were admitted on certain conditions, and then traded each on his own account; and the joint-stock company, in which the trade was carried on in behalf of all its members by the managing board and officers of the company. The latter might be either incorporated (in which case it differed only in the extent of its powers and the character and range of its operations from the modern business corporation), or unincorporated (in which case it was simply a great partnership, of the type known to us as a joint-stock association). In all cases, however, it was usual to vest in the company, or in its officers or managing directors, legal jurisdiction over its members, and, in the case of the colonizing companies, a territorial jurisdiction as well. The famous company, known as the Merchant Adventurers of England, whose beginnings can be traced back to the year 1359, was originally of the type of trading companies, but was incorporated two hundred years later by a charter of Elizabeth. The Eastland Company, the Russia (or Muscovy) Company, the Levant (or Turkey) Company, were of the same character. The great colonizing companies under whose auspices the first English settlements in the New World were made—as the Virginia Company, chartered in 1609; the Massachusetts Bay Company, chartered in 1629—were of a composite character, being incorporated for the express purpose of founding new colonies, but organized for trading purposes on the principles of the regular trading companies. The East India Company, on the other hand, chartered in 1600 as a trading company, pure and simple, became a joint-stock company in 1612, and the Hudson's Bay Company, incorporated by royal charter in 1670 (which, shorn of most of its ancient privileges, is still in active existence), is also for trading purposes a joint-stock association.

The extensive powers of government, and even the legal jurisdiction over their own members, formerly vested in these old trading companies, have long since been resumed by the Crown. Their present significance lies in the fact that they constitute the beginnings and the foundation of the colonial empire of Great Britain. But the principles on which they were organized and conducted are, with some modifications, still recognized and acted upon in that country. Chartered companies for purposes of trade and colonization in territories not under the sway of Christian powers are still created, and some such companies of recent origin have played an important rôle in the history and politics of the past twenty years. Among these may be mentioned the North Borneo Company, chartered in 1881; the Royal Niger Company, in 1886; the British East Africa Company, in 1888, and the

British South Africa Company, in the same year. All of these companies have had qualified rights of sovereignty and powers of government vested in them, and they have all continued the rôle of the older companies in expanding the limits of the British Empire. See Anderson, *Origin of English Commerce*; Cunningham, *Growth of English Industry and Commerce*; Schanz, *Englische Handelspolitik*; Cawston and Keane, *Early Chartered Companies*; Westlake, *International Law* (London, 1880); Hall, *Treatise on the Foreign Powers Jurisdiction of the British Crown* (Oxford, Eng., 1894); and the comprehensive treatise of Bonassieux, *Les grandes compagnies de commerce* (Paris, 1892).

CITY COMPANIES. The incorporated trades or guilds of the city of London. The origin of these companies is to be traced back to the close organization and exclusive membership of the mediæval craft or trade guilds, which appeared in England in the early part of the twelfth century. These had various privileges conferred upon them from time to time by royal charter until, in the latter part of the fifteenth century, they exercised all the powers of government within the city of London, and, indeed, constituted its entire citizenship. Thereafter the 'freedom of the city' consisted in membership, as a 'liveryman,' or 'freeman,' of one of the city companies, and the franchises of the city were exercised in this fashion until 1725, when the companies were deprived of some portion of their political authority by act of Parliament. They were further restricted by the reform legislation of 1832 and 1867, but still retain the right of choosing the Lord Mayor, the Sheriff, Chamberlain, and other civic officers. Though the companies have by lapse of time entirely lost their trading character, they still retain their ancient organization, many of their exclusive privileges, and, in some cases, great wealth. There survive 12 great companies and 62 lesser ones. See **GUILD**; **LONDON**; and consult Brentano, *Guilds*; Gross, *Gild Merchant*; Norton, *The City of London* (London, 1829); and *Report of the Royal Commission on the Livery Companies* (Parliamentary Papers, 1884).

MODERN TRADING COMPANIES. In a legal sense, the term company may be applied to any association of individuals for business purposes. This may be a partnership of the ordinary type, a joint-stock association—which is commonly a large partnership formed and conducted in ways prescribed by statute—or a business or trading corporation. It is in the last sense that the term is commonly employed in England. In the United States it has no such definite legal signification. Though there is no inappropriateness in applying it here to any of the three forms of association above enumerated, it usually refers to the second or third form. The expression 'company law' may have reference either to the law of business corporations or of unincorporated associations. All of these forms of association for trading purposes are dealt with under their respective heads. See **CORPORATION**; **JOINT-STOCK ASSOCIATION**; **PARTNERSHIP**; **VOLUNTARY ASSOCIATION**, and the titles and authorities referred to thereunder.

COMPANY. In military organization, an aliquot part of a regiment or battalion, though not absolutely or necessarily so. In the United States all infantry regiments are divided into

companies, as is also the corps of engineers. Troops of cavalry and batteries of artillery generally correspond in command and organization to companies of infantry. The average strength of companies in the United States and British armies is 100 men. On the Continent of Europe the number varies from 100 to 250 men in Germany and Russia. In the former country the captain of infantry is a mounted officer, and has three subaltern officers under his command. The general trend of modern military tactics is to reduce the size of the unit of command in attack formations, largely because of the vast area over which comparatively small bodies of troops are scattered, and the corresponding difficulty of their effective control; thus the importance which heretofore has attached to the regiment or battalion is likely to attach to the company, and greatly alter its present formation and organization. See **ARMY ORGANIZATION**; **TACTICS**, **MILITARY**.

COMPANY, JOHN. The popular name for the old East India Company (q.v.).

COMPANY, SHIP'S. All persons who are regularly employed in various capacities on board a ship. In the United States Navy it is also frequently used to designate the crew only. See **COMPLEMENT**; **CREW**.

COMPARATIVE ANATOMY. For definition, scope, and bibliography, see **ANATOMY**, and **ANATOMY, COMPARATIVE**. In this work all the larger topics dealing with the anatomy and physiology of men and animals have been treated comparatively and with reference to their evolution. Such is the character of **ALIMENTARY SYSTEM**; **CIRCULATORY SYSTEM**; **EAR**; **EXCRETORY SYSTEM**; **EYE**; **FOOT**; **HAIR**; **HAND**; **INTEGUMENT**; **MUSCULAR SYSTEM**; **NERVOUS SYSTEM**; **PELVIS**; **REPRODUCTIVE SYSTEM**; **RESPIRATORY SYSTEM**; **SKELETON**; **SKULL**, and similar articles, in which the reader will find the methods of comparative anatomy exemplified.

COMPARATIVE GRAMMAR. See **GRAMMAR**.

COMPARATIVE MYTHOLOGY. See **MYTH** and **MYTHOLOGY**.

COMPARATIVE PHILOLOGY. See **PHILOLOGY**.

COMPARATOR (Lat., *comparare*, from *com-*, together + *par*, equal). An instrument used in comparing the lengths of two graduated scales and in determining accurately the amount of their difference. It consists essentially of two microscopes, each fitted with cross-hairs and capable of being moved by a micrometer screw, or else supplied with a micrometer eye-piece, or often both. (See **MICROMETER**.) These micrometer microscopes are so mounted that they may be moved both laterally and forward and backward, and through them the observer looks down on the scale which is being examined. The microscopes are then moved so that their cross-hairs are either at the end or over some division of the scale, which often is so magnified that in making a setting it is convenient to bisect the enlarged image of the mark. By means of rollers or other mechanism the platform containing the first scale is temporarily removed and a second introduced in its place. In this case the intersections of the cross-hairs are probably some small dis-

tance away from the corresponding division of the other scale, and this amount, as determined with the micrometers, is their difference at that temperature. While the operation of comparing two scales does not seem particularly complicated, nevertheless, in order to secure the desired high degree of precision, elaborate precautions are taken both in the construction and manipulation of the apparatus. The temperature at which the scales are compared is of course no unimportant consideration, and in order that this should be uniform and easily determined, they are immersed in a bath of liquid whose temperature can be maintained at some constant point. In the comparison of standards there must of course be an ultimate standard to which all measures of length are referred, and this bar is considered correct at some one stated temperature. Copies of this are made and serve as secondary standards whose coefficient of expansion, minute errors, and other constants are known. Such comparisons are performed by the International Bureau of Weights and Measures at Paris, where comparators susceptible of the most accurate results and possessing all possible refinements are employed. (See WEIGHTS AND MEASURES.) Similar but usually less precise apparatus is found also in the various national standard bureaus and physical laboratories. The *Mémoires du Bureau International des Poids et Mesures* (Paris) contain full and technical descriptions of the most accurate and approved apparatus and methods.

COMPARETTI, kôm'pâ-rêt'tè, DOMENICO PIETRO ANTONIO (1835—). An Italian philologist, born in Rome. He studied mathematics and the natural sciences, and in 1859 became professor of Greek in the University of Pisa. A few years later he accepted a similar position at Florence, and afterward went to Rome, where he conducted the lectures on Greek antiquities at the university. Aside from his Greek studies, he is distinguished as a scholar in Romance philology and in the culture-history of the Middle Ages. His most important works are: *Saggi dei dialetti greci dell'Italia meridionale* (1866); *Virgilio nel medio ero* (1872; Eng. trans. 1899); *Papiro ercolanese* (1875); *La commissione americana di Pisistrato e il ciclo epico* (1881). With d'Ancona he edited *Canti e racconti del popolo italiano* (1870-91); with others the *Rivista di filologia e d'istruzione classica*, and since 1884 has been editor also of the *Musco italiano di antichità classica*.

COMPARISON (OF. *comparaison*, Fr. *comparaison*, from Lat. *comparatio*, from *comparare*, to compare). In grammar, and as applied to adjectives (q.v.), that which marks the degree in which the quality is attributed to the object, as compared with other objects. There are three degrees of comparison. The positive indicates the quality generally, without comparison; the comparative, a higher degree of the quality than is attributed to other things; and the superlative, the highest degree that is attributed to any of the things under consideration. Sometimes the positive is not regarded as a degree of comparison. There are two ways of expressing these degrees. (1) By an inflection or change of the word: as, hard, harder, hardest; happy, happier, happiest. This mode prevails almost exclusively in Greek and Latin. (2) By

an additional word, as more happy, most happy. This may be called logical comparison, the other, grammatical. In French, with the exception of a few irregular adjectives, all adjectives follow the logical method. In English, the logical method is generally preferred when the grammatical would produce a word difficult or harsh in the pronunciation. This is generally the case in English when the simple adjective is of more than one syllable; but it is not always so. Thus, earnest, prudent, would make harsh combinations; not so polite, discreet, happier. The difference is, that in earnest, prudent, the accent being on the first syllable, two unaccented syllables of discordant character are thrown together; in polite, discreet, the unaccented syllables are separated; and in happier, though they come together, they readily coalesce. Thus, the laws of euphony determine this point, as they do much else in language. Carlyle and Ruskin use many comparative and superlative forms that are not generally recognized. In general, it is only adjectives of quality that admit of comparison; and even adjectives of quality cannot be compared when the quality does not admit of degrees; as, a circular space, a gold ring, a universal wish. Adverbs (q.v.) in English are compared exactly like adjectives, logical comparison predominating.

COMPASS (OF., Fr. *compas*, compass, from ML. *compassus*, circle, from Lat. *com-*, together + *passus*, step, from *pandere*, to spread out). The most important instrument used in the navigation of a ship. It consists of a number of magnetic needles placed with their axes parallel; a framework supporting the needles, and a circular disk marked in points and degrees, called a *compass-card*; the pivot on which the framework rests; and the *compass-bowl*, containing the compass. This latter is, in turn, mounted on gimbals in a binnacle (q.v.) and further protected by a binnacle-cover. Compasses are of two general types, *dry* and *liquid*. The best-known form of dry compass is that designed by Lord Kelvin (Sir William Thomson, before his elevation to the peerage). It consists of a central boss and outer rim, both of aluminum connected by numerous radial silk threads. The magnets, eight or more in number, are held in parallelism by threads and supported by other threads from the rim. The latter has a paper cover marked in degrees and points. This compass is very light, and therefore will be very sensitive and yet not have too much throw as the ship moves. Furthermore, the weight, such as it is, being largely in the rim, will tend to check a tendency to liveliness. The dry compass is cheap and reasonably satisfactory in other respects, and is much used. In the United States Navy and in many ships of the merchant service a liquid compass is used. The bowl is filled with alcohol and water. The compass-needles, in two or more bundles, are sealed in parallel tubes, which form the framework connecting the central boss to the rim. Both rim and boss are hollow, and, like the needle-tubes, are of white metal or aluminum alloy. The markings of the ordinary compass-card are painted upon the rim in degrees and points. The whole float, consisting of rim, boss, and magnetic tubes, is slightly heavier than the liquid, so that it rests very lightly upon an agate pivot-bearing in the boss, which is supported upon a pivot

rising from the bottom of the bowl. The liquid checks the tendency of the compass to jump when the ship has considerable motion, and the vibrations of the machinery, which are apt to disturb dry compasses, have no effect upon a liquid one.

The compass-needle is drawn away from the horizontal plane by the vertical component of the earth's magnetic force by an amount called the *dip*, or *inclination*. The *error* of the compass, which is the result of forces acting in the horizontal plane, is the angle between the direction of the needle and the true, or geographic, meridian. It is made up of the *variation*, or angle, between the true and magnetic meridians (q.v.), which represents the deflecting effect of the earth's magnetism, and the *deviation*, or angle, between the magnetic meridian and the needle, which represents the deflecting effect of the ship's magnetism.

The *variation* is due to the fact that the lines of magnetic force which affect the needle are parallel to the geographic meridian in only a few places on the earth. The direction of one of these lines at any point is the direction of the magnetic meridian there; that is, the direction in which a freely suspended magnet will lie. The variation of the compass at any point is not usually stationary, but changes from year to year, increasing to a certain maximum, decreasing to a minimum, and then increasing, in a very regular manner, so that, within limits, its amount at any future time may be predicted. It is also subject to slight monthly and daily changes. The daily change consists of a small easterly movement during the morning, reaching a maximum about 7 A.M.; then a somewhat faster westerly movement, the limit of which is reached about 1 P.M.; the return easterly movement is completed at 9 or 10 P.M. Both daily and monthly changes are small and of no importance in navigation. The average daily range is about 9.3 minutes of arc. Irregular changes of variation, occasionally amounting to 3 or 4 minutes of arc in a few minutes of time, are of frequent occurrence: they are said to be due to *magnetic storms*. See MAGNETISM. TERRESTRIAL.

Magnetic charts show the variation, dip, etc. The irregularly curved lines connecting the points of equal variation are called *lines of equal variation*, or *isogonic lines*; the isogonic line connecting points of no variation is called the *agonic line*. The lines of *equal dip* are irregular curves surrounding the magnetic pole, and are called *isoclinic lines*. The line of *no dip* is the *magnetic equator*. The dip of the needle, like the variation, is constantly changing, but the range and rate of change is less. See DECLINATION; INCLINATION.

The *deviation* of the compass is produced, as has already been stated, by the action of the magnetism of the ship in which the compass is mounted. In the days of wooden ships the deviation was usually very small, even in steamers. But steel and iron hulls produce important deviations in well-placed compasses, and excessive deviations in those badly located: it is possible, indeed, so to place a compass that the needle will point to a particular part of the ship, without regard to her heading. In placing compasses, due regard must then be paid to the magnetic forces of the ship, as well as to the convenience of the navigator and helm-man. Standard compasses are commonly placed at

some distance above the upper deck and abaft the middle of the ship. The steering compasses are placed beside the wheel, or steering apparatus. Other compasses are found in large ships.

The deviation of a compass varies as the ship turns about, or in azimuth. A portion of the hull is permanently magnetized and acts as a permanent magnet: the rest is in a variable state of magnetization, depending upon the direction in which the ship heads and the magnetic latitude. As it is important that the deviations in all directions should be known, in order to steer a correct course, they are determined by *swinging ship*. This is accomplished by successively pointing the ship in the various directions (usually every two points) and comparing the bearing of the sun or a distant object with its true bearing obtained by computation, or from prepared tables. This gives the compass *error*. Applying the *variation* to the result, we obtain the *deviation* on each point on which bearings were taken. A table of deviations is a necessary adjunct to every compass. When the deviations are considerable, as is almost invariably the case with steering compasses, and usually with standards, it is customary to correct them by reducing the deviation. The character and extent of the correction or compensation may be ascertained by magnetic observations on the ship and on shore: from which follow elaborate computations upon the results of which depend the placing of the correctors. This method involves an investigation of the whole theory of magnetization of ships. A simpler one now rapidly coming into favor is called the *rectangular method of compensating*. The deviation is determined upon adjacent cardinal points, as (magnetic) north and east. The ship is headed on north, and kept on that heading by using another compass, and a number of small magnets slipped into holes in a block or case under the compass. These magnets point fore and aft, and are inserted until a sufficient number have been put in to bring the compass to point to magnetic north. The same process is repeated when the ship is headed east, but the magnets now put in are laid athwartship. Next the ship is headed northeast (magnetic), and the soft iron spherical correctors are moved out (i.e. away from the compass) until the needle points correctly. This completes the operation, unless a Flinders bar is used: this consists of a soft iron vertical bar, placed to counteract the induced magnetism in soft vertical iron, and is placed forward or abaft the compass, as found necessary. The ship must then be *swung for residuals*; that is, turned and headed on the different points (or every two points), and the small residual errors remaining after compensation ascertained. These may be reduced by re-correcting, but are usually too small to render that necessary; a table of these deviations is, however, made out for use in laying the ship's course. In addition to the deviation of the compass produced in the manner already described, further deviations are caused by the rolling. This is corrected by a vertical magnet, placed below the axis of the compass and at such a distance as will correct a deviation produced by the inclination of the ship.

The compass-card is divided into 32 *points*. Of these, four are called the *cardinal points*, north, east, south, and west (abbreviated N., E.,

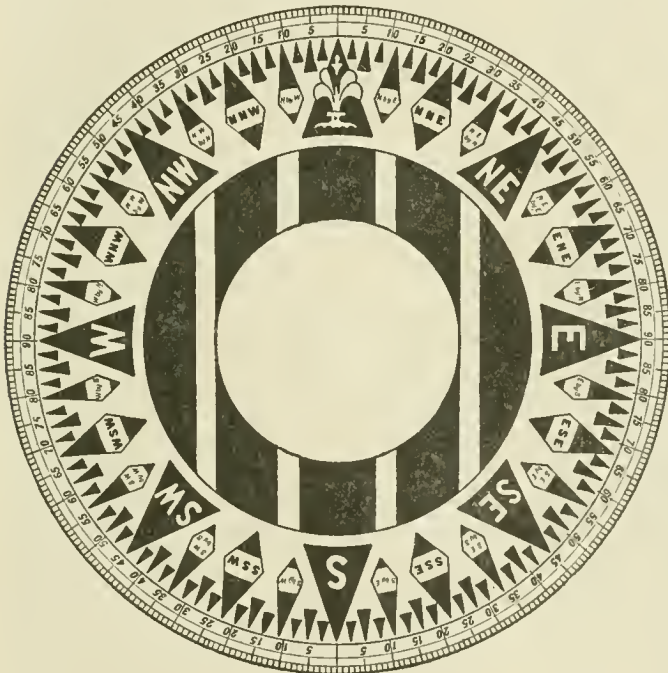
S., and W.); and four are the intercardinal points — northeast, southeast, southwest, and northwest (abbreviated N.E., S.E., S.W., and N.W.). The points half way between a cardinal and intercardinal point has a name compounded of the two, the cardinal point being given first; thus, half way between N. and N.E. is north-northeast (N.N.E.), and half way between east and northeast is east-northeast (E.N.E.). The point on each side of a cardinal or intercardinal point is designated by first giving the name of the primary point, then the word *by* and the name of the adjacent cardinal point. Thus, the point to the east of north is north by east (N. by E.); to the east of northeast is northeast by east (N.E. by E.); similarly, we have east by north, south by west, etc. Smaller angles than points are given in half-points, quarter-points, and eighth-points. These are, in addition to the full points, reckoned from north and from south toward east and west; remembering, however, that from the cardinal and intercardinal points for one point each way the fractional parts of a point are reckoned toward the adjacent cardinal point. This gives the points of the compass as follows:

To recite these points, half-points, quarter-points, and eighth-points in the proper order is called *boxing the compass*, and to do so correctly, and to understand the taking of bearings, etc., are among the requirements of a good helmsman or quartermaster (q.v.).

For the purpose of taking bearings, an *alidade* or *azimuth circle* is used. The former is usually attached to the top of the binnacle-cover, or to some form of dumb compass (a metal plate marked with compass points); it consists of a pivoted bar carrying sights, and by comparing the dumb-compass bearing with the compass heading of the ship, the compass bearing of an object may be obtained. The *azimuth circle* fits over the top of the compass bowl, and has reflecting mirrors and sighting wires; by their means the bearing of the sun or other object is ascertained directly from the compass. When the bearing of an object is taken from the north or south point, its angular distance from true north or south is called its azimuth. Thus, if an object bears northeast, its azimuth is N. 45° E.

The early history of the compass is involved in more or less obscurity. In a rough form it was

known to the Chinese at least as early as B.C. 2634, and it was used for the purposes of navigation as early as the third or fourth century A.D., and perhaps before. But the policy of the rulers and the habits and character of the people conspired to render the Chinese indifferent navigators, and the compass did not, therefore, become of the great importance to them that it did to the seafaring nations of Europe. The date of introduction of the magnetic needle into Europe is unknown; but if it came, as many suppose, from the Chinese through the Arab sailors and traders, it probably was already a nautical instrument. The first reference to it in literature is in a work by Alexander Neckam, entitled *De Utilisibus*, and written in the twelfth century. He refers to it as a needle which is placed on a pivot and when allowed to come to rest shows the mariner the direction to steer. In another work, *De Naturis Rerum* (lib. ii., c. 89), he writes as follows: "Mariners at sea,



COMPASS-CARD.

N.	E.	S.	W.
N. by E.	E. by S.	S. by W.	W. by N.
N. N.E.	E. S.E.	S. S.W.	W. N.W.
N.E. by N.	S.E. by E.	S.W. by S.	N.W. by W.
N.E.	S.E.	S.W.	N.W.
N.E. by E.	S.E. by S.	S.W. by W.	N.W. by N.
E. N.E.	S. S.E.	W. S.W.	N. N.W.
E. by N.	S. by E.	W. by S.	N. by W.

One quadrant in quarter-points is as follows:

N.	N. N.E.	N.E.	E. N.E.
N. ¼ E.	N. N.E. ¼ E.	N.E. ¼ E.	E. N.E. ¼ E.
N. ½ E.	N. N.E. ½ E.	N.E. ½ E.	E. N.E. ½ E.
N. ¾ E.	N. N.E. ¾ E.	N.E. ¾ E.	E. N.E. ¾ E.
N. by E.	N.E. by N.	N.E. by E.	E. by N.
N. by E. ¼ E.	N.E. ¼ N.	N.E. by E. ¼ E.	E. ¼ N.
N. by E. ½ E.	N.E. ½ N.	N.E. by E. ½ E.	E. ½ N.
N. by E. ¾ E.	N.E. ¾ N.	N.E. by E. ¾ E.	E. ¾ N.
			E.

when, through cloudy weather in the day, which hides the sun, or through the darkness of the night, they lose the knowledge of the quarter of the world to which they are sailing, touch a needle with a magnet, which will turn round till, on its motion ceasing, its point will be directed toward the north" (Chappell, *Nature*, No. 346, June 15, 1876). Subsequent to this there are repeated references to the use of a magnetic needle for navigating purposes. As early as the thirteenth century it seems to have been known to the navigators of all European nations, and in 1269 its declination (or *variation* from the true north) seems to have been

observed. The division of the compass-card into thirty-two points is a natural one, and was merely continuing the subdivision until it became sufficiently minute. It seems to have been adopted early, as Chaucer writes of it as established in 1391.

BIBLIOGRAPHY. Consult: The *Admiralty Manual for the Deviations of the Compass*, by Capt. F. J. Evans, R.N., F.R.S., and Archibald Smith, M.A., F.R.S. (new editions appear at short intervals): *Naval Professional Papers of the United States Navy*, No. 22 (Washington, 1886); Cornwell, *Compass Disturbance in Iron Ships* (1887); Bowditch, *The American Practical Navigator* (Washington, 1901); publications of the Superintendent of Compasses, United States Navy.

COMPASS, SOLAR. An instrument for determining at any place an accurate north and south line. It has a latitude range of about 35°, and may be adjusted to the latitude of any place in the United States. It has a latitude arc, a declination arc, and an hour arc, each to be duly adjusted for an observation, and has been found of much service in running important boundary lines and other Government surveys. One of its recommendations is its avoidance of the perplexities caused by local attraction. It is the invention of William A. Burt, of Michigan. For illustration see Plate of **ENGINEERING INSTRUMENTS**.

COMPASSES. A mathematical instrument for transferring or marking off distances or for drawing circles. The common compasses or dividers are composed of two rods or legs joined together by a pivot-joint at one end and pointed at the other; when adapted to drawing arcs the lower parts of the legs admit of receiving a pen or pencil.

Beam compasses consist of points sliding on a bar, to which they may be clamped at any distance from each other. They are used for lengths greater than the pivot compasses can expand, and when delicately made can be used for more accurate dividing. See **GRADUATION**.

Proportional compasses have a point at each end of each leg, and the pivot between, thus forming a double pair of compasses opposite to each other. If the pivot is midway between the ends, the opening of each pair of points will be equal. If its distance from one pair of points be double that from the other, the openings will be as two is to one, and so on for any ratio. To adapt them for variable proportions, the pivot is made a clamping screw, which moves in an elongated slot in the legs, and may be fixed at any point.

Triangular compasses have three legs, so that the vertices of a triangle may all be transferred at once.

Bullet or club compasses have a ball in place of one point, adapted to turning in a hole. See also **CALPERS**; **ELLIPSE** (ellipsograph, or oval compasses).

COMPASS-PLANT (*Silphium laciniatum*). A large plant called also 'resin-weed,' because it abounds in resinous matter. It grows on the prairies, and the edges of its stem-leaves are said always to point directly, or nearly, north or south. When cultivated in gardens, this property does not always appear. The same phenomenon is exhibited by the stem-leaves of prickly

lettuce (*Lactuca scariola*). In this plant the leaves are usually considered as vertical, but this is brought about by a twist near their bases. The peculiar arrangement of the leaves of these plants is due to their adaptation to light. Both surfaces of the leaves are equally sensitive to light, and only by presenting their edges vertically and their tips to the north and south are they able to secure equal illumination to both sides of the leaves.

COMPENSATION. In law, a counterclaim or set-off: in the civil-law systems of Scotland and the Continental States, the doctrine corresponding to that of set-off in the English and American law. It provides that, where two parties are mutually indebted, their debts shall extinguish each other if equal, and if unequal, leave only a balance due. In order to avail one's self of the principle of compensation, the set-off or counterclaim must be pleaded, as it does not operate *ipso jure*; but, when pleaded, it is held to operate from the period of concurrence, the interest on either side being stopped from that time.

Compensatio injuriarum is a defense against actions of damages for slander or the like. It is not a bar to an action, but a set-off or counterclaim. In the common-law system of England and the United States, it is not permissible to set off one trespass or other wrong against another, but each injury must be compensated by a separate action; and in Scotland the leaning recently has been in the same direction. See **CONTRACT**; **TORT**; **DAMAGES**; and consult the authorities there referred to.

COMPENSATION (Lat. *compensatio*, equalization, from *compensare*, to equalize, from *com-*, together + *pensare*, to weigh, frequentative of *pendere*, to weigh). A term used in physical experiments to describe methods where sources of error or other conditions are neutralized by the introduction of factors which act in an opposite direction by an equal amount, and compensate for the original error. For example, a flint-glass convex lens, in addition to refracting rays of light, also separates them into their spectral colors. This can be compensated by combining with the convex lens a concave lens of crown glass which has less refraction but greater dispersive power. Such a lens, being opposite in its effect to the first lens, will unite the rays, but does not destroy the deviation. (See **ACHROMATISM**.) In the case of the pendulum (q.v.), an increase in temperature causes it to lengthen, and consequently oscillate more slowly. Compensation is here effected by raising its centre of oscillation with any increase in length due to a rise in temperature, and thus keeping constant the distance between its point of support and its centre of oscillation. In a chronometer the balance-wheel is compensated by constructing its rim of two metals with different coefficients of expansion. An increase in temperature tending to expand the wheel is compensated by the rim being brought nearer the centre, it being curved inward by the uneven expansion of the metals. See **WATCH**, for further description and illustration of a compensating balance-wheel.

COMPETENCE, or COMPETENCY. As a law term, used in the sense both of authority and of legal ability. It is in the former sense that

it is employed in the law of France and of other Latin countries, as the equivalent of our term 'jurisdiction,' the competence of a tribunal being its authority or jurisdiction over a given person or proceeding.

In English and American law, the word is specifically used to denote the legal fitness or eligibility of a witness to be heard, or of a judge or juror to participate in the trial of a cause. Competency, in the legal sense of the term, does not refer to mental or physical ability, but to purely legal grounds of qualification—as that a judge or juror shall not be personally interested in the issue to be tried; that a witness shall not be so related to the transaction on which the suit is based as to be incapacitated by law from giving evidence thereof. Such facts as the credibility of a witness, the relevancy of his testimony, or even his actual knowledge of the transaction in question, have no bearing upon the question of his competency. He may be competent to participate as a witness, and may yet be utterly untrustworthy or ignorant of the facts involved in the issue. So, not having been an actual, percipient witness of the facts to which he is called upon to testify, he may have his testimony excluded as mere hearsay, without thereby having his legal competency questioned. In that case it is not the witness, but the evidence offered by him, that is 'incompetent.' Competency, whether of judge, or juror, or witness, is always presumed, until it is impeached and the contrary shown. The question is one for the court, which may inquire into the facts for the purpose of arriving at a judgment upon it. The law as to the competency of witnesses will be considered under the title WITNESS. See, also, EVIDENCE; JUDGE; JURY; and the authorities there referred to.

COMPETITION (Lat. *competitio*, rivalry, from *competere*, to vie, from *com-*, together + *petere*, to seek). This term has been defined as the struggle for existence carried into human affairs. It is, in general, the conflict of efforts directed to the same goal. In this sense it is applied to the method of appointing government officials under civil-service rules, to the contests of political parties, the often amusing rivalry of one city with another for population, trade, etc., and a host of similar rivalries. In the world of economic effort it is recognized as the great regulative principle which holds in check the overreaching designs of individuals, and makes their selfish efforts contribute to the general welfare.

As self-preservation is said to be the law of nature, so may self-interest be said to be the law of industrial society. Every man labors for his own ends. To provide food and raiment, to minister to his necessities and to his enjoyments, is the motive which leads him to action. In the pursuit of his individual welfare he is not wholly unrestrained, for the influences of law and morality set bounds to his permissible actions. But within those bounds every man seeks first his own welfare. Nevertheless, at every step he comes into contact with others whose actions limit his own. If he is a seller of merchandise his interest is to secure the highest price; but other sellers are equally eager to part with their goods, and in this rivalry prices are lowered to a point at which all the goods may be transferred. If he is a buyer he offers the lowest price, but he finds

other buyers offering higher prices, and he must raise his offer to such a price that all the buyers, able to afford the first price, can be satisfied by at least a share in the goods to be sold. The rivalry of buyers and sellers is the competition of the market, which becomes an equitable adjustment of supply and demand.

The process by which the competition of individuals increases the aggregate wealth and promotes the welfare of society at large is very simple. If the producer must sell at the market price, his only chance for gain consists in lowering his costs and increasing the margin between what he obtains for his goods and what he gives for them. Competition, therefore, makes him keen to obtain the most effective results of his activity, to economize his labor, to improve his methods, to lop off wasteful practices and useless expenditures; to scrutinize, in short, every detail of the process of making and selling his goods in order that wherever possible he may effect economies. This ingenuity inures in the first instance to his own benefit; but as other producers follow the same practice, the general cost of producing goods is lowered, and with it the price of the goods. For if price be not lowered, the unusual rewards which the enterprise offers will tempt others to undertake it, and, by enhancing the volume of goods to be sold, inevitably lower their price. A decrease in the cost of production results in an increase of the volume of goods produced by the expenditure of the same effort. It is this increase which constitutes the growth of wealth for the community at large.

The same competition which regulates the price of goods governs, in large measure, the relations of capital and labor. It is the competition of employers for labor, and that of laborers for employment, that fixes at any given time the rate of wages. This competition is not so free as that between buyers and sellers. Capital may lie idle for a time without diminution, but the laborer may not cease work without starvation. Hence the contest seems at times a very unequal one, and the issue to be decided by the needs of the laborer rather than anything else. If all the competition were among laborers themselves, and if there were insufficient employment offered, workmen would be forced to make such terms as they could. But it is quite as likely that there should be an abundance of employment seeking workers, and in such cases the workman might make what terms he pleases.

It must be conceded that, important as are the workings of competition, ideal competition in which the buyer always seeks the cheapest and the seller the dearest market, in which capital is free to seek the place where labor is cheapest, and labor able to select the employment which offers the best wages, is not and cannot be realized. As tendencies, the laws of competition are valuable regulative principles in the world's economic activity, even if they cannot be fulfilled to the letter. It has, however, been found impossible wholly to overcome the inertia of custom, and impracticable to check all attempts at combination which seek to destroy the competitive principle.

Custom and sentiment are supposed to have no place in business, and in wholesale transactions this is quite true, but in the small transactions

of daily life they have a large place. They owe it to the fact that we are slow to change acquired habits, especially where the gain to be secured is slight. Thus we find everywhere customary prices for certain commodities and services. The fares of railroads, ferries, cabs, street railways, the services of physicians and lawyers, the fees of various public entertainments, are governed almost wholly by custom. These we accept or reject, but we do not haggle about them. In the long run, competition has something to do with such prices or with the goods or services they command, but in each individual transaction it hardly enters in as a factor. In the sale of completed commodities competition works out its effects most clearly. In the field of production it works amid inherent obstacles to its full development, and cannot have so absolute a scope. Capital, as we have before hinted, is not migratory; it has its permanent instruments, which cannot be easily uprooted and transplanted. The farmer is not free to leave his farm when he sees a chance of greater profit elsewhere. The workman is not free to pass from one employment to another, for he may lack the requisite training; nor is he often free to run to more remunerative fields of labor. Thus the immobility of capital and labor acts as a restraint upon the action of competition.

If the freest competition is in the interest of the community at large, it is equally true that such competition is always irksome to the competitors. It cannot be wondered that they seek means of counteracting its force through combination. Such a combination may be a tacit understanding such as frequently exists among local dealers. It may be organized in great aggregations of capital, which seek to dominate entire fields of productive effort. To a certain extent, such combinations may supplant direct competition as a regulative principle, but they cannot obliterate it entirely.

Nor is the régime of competition absolutely free from interference by law or governmental authority. Certain of the older economists vehemently denounced factory legislation as an inroad upon the domain of competition. In more recent times it is, however, recognized that, while maintaining free competition as the basic principle of industrial organization, it is in the general interest that some of the conditions of competition be fixed by State action. Consult: Nettleton (editor), *Trusts or Competition: Both sides of the great question in business, law, and politics* (Chicago, 1900). See LABOR LEGISLATION; POLITICAL ECONOMY; MONOPOLY; TRADES-UNIONS; TRUSTS; and consult the authorities there referred to.

COMPIÈGNE, κόμ'πυά'νυ' (Lat. *Compendium*). A town in the Department of Oise, France, on the river Oise, a little below its junction with the Aisne, and 33 miles east-southeast of Beauvais (Map: France, J 2). A fine stone bridge crosses the river at this point. The town is irregularly built, but is picturesque and has a remarkable Gothic Hôtel de Ville, with museum and library, and a magnificent palace built anew by Louis XV. and splendidly fitted up by Napoleon I., and again by Napoleon III., both of whom often occupied it. It contains a library, a picture gallery, and various objects of interest. The park is extensive, and adjoining the gardens is the beautiful Forest of Compiègne, ex-

tending over about 30,000 acres. The industries of the place are rope-making, boat-building, and weaving hosiery. There is considerable trade in wool, grain, and cattle. Population, in 1901, 14,009; commune, 16,503. Compiègne is mentioned in the times of Clovis under the name of *Compendium*; and it was the seat of several political assemblies and ecclesiastical councils. It was at the siege of this town, in 1430, that Jeanne d'Arc, the Maid of Orléans, was captured, and here, in 1810, Napoleon and Maria Louisa of Austria first met, on the occasion of their marriage.

COMPITALIA, or LUDI COMPITALICII (Lat., Compitalian games, from *compitum*, cross-road, from *compere*, to coincide, from *com-*, together + *petere*, to seek). A festival in Rome in honor of *lares compitales*, the divinities presiding over places where two or more roads meet. Macrobius says that Tarquinius Superbus restored the festival, which had been neglected, and sacrificed boys as a part of the services. Human sacrifices, if ever really made, did not survive the Tarquins; for, after their expulsion, garlic and poppies were offered. Consult Fowler, *Roman Festivals of the Period of the Republic* (London, 1889).

COMPLAINT, THE. A collection of poems in blank verse, by Edward Young (1742), better known under their secondary title, *Night Thoughts*. They were written after the death of his stepdaughter and her husband, who are referred to under the names of Narcissa and Philander.

COMPLAINT OF MARS AND VENUS, THE. A poem by Chaucer, written about 1380, containing an introduction and two separate poems, "The Complaint of Mars" and "The Complaint of Venus." At the conclusion, the author says it was taken from the French of 'Graunson.' The introduction tells how Venus and Mars are waked by 'Phœbus's Light,' and how, fearing his burning rays, Venus flees to a cavern in the tower of Ciclinius, who guards her from danger. While she is there, unknown to Mars, he raves about the universe, making complaint for his lost love. The complaint of Venus is hardly an answer to his complaint, but rather a regret that even the best of men are liable to jealousy.

COMPLAINT OF PITY, THE. "How Pitié is dead and buried in a gentle Herte;" a poem by Chaucer (1367).

COMPLAINT TO HIS PURSE. A short serio-comic poem of twenty-one lines by Chaucer; in which, at the end of each stanza, he entreats his empty purse to "Be heavy againe, or els mote I die." The poem was sent as an appeal to King Henry IV., and resulted in an increase of the poet's pension. It was, by some, attributed to Oeeleve.

COMPLEAT ANGLER, THE. A famous work on angling, by Izaak Walton (1653). It is written in a pleasing style; parts being in the form of conversations between Piscator, Venator, and Viator—a fisherman, a huntsman, and a pedestrian—interspersed with a few quaint old songs.

COMPLEMENT (Lat. *complementum*, that which fills up, from *complere*, to fill up, from *com-*, together + *plere*, to fill; connected with Gk. *πιμπλάναι*, *pimplanai*, Skt. *pūr*, *pur*, to fill,

Lith. *plnas*, OChureh Slav. *plnũ*, OIr. *lõn*, full. Goth. *fulls*, OllG. *fol*, *foll*, Ger. *voll*, AS. Eng. *fully*. In mathematics, that which completes a given magnitude or increases it to the value of a fixed magnitude. In angular measure it signifies the angle which, added to a given angle, produces 90°; e.g. 30° is the complement of 60. 1° is the complement of 89°, 45° is the complement of 45°, 100° of -10°, and 0° of 90°. Such pairs are called complementary angles. The arithmetic complement of an integer is the difference between the integer and the next higher power of 10; e.g. 40 is the arithmetic complement of 60, 1 is the arithmetic complement of 99, 375 of 625, and 7 of 3. The complement logarithm, or 'cologarithm,' of a number, is the logarithm of the reciprocal of the number, or the complement of the logarithm (of the given number) less 10. See LOGARITHM.

If through any point on the diagonal of a parallelogram lines are drawn parallel to the sides, four parallelograms are formed. The two of these that are not bisected by the given diagonal are called complements of the given parallelogram.

COMPLEMENT. In music, the interval which must be added to any given interval to complete the octave; for example, a fourth is the complement of a fifth, a third is that of a sixth, etc.

COMPLEMENT. In nautical language, all persons designed to be on board a ship for the purposes of navigating or fighting her, or to enable her to carry on the service for which she is intended. The complement includes the officers and crew; but the latter terms apply to the persons actually on board, while the former applies to all who *should* be on board if there are no vacancies.

COMPLEMENTARY COLORS. Colors which, when combined, produce white light. Examples of pairs of such colors are given in the following table:

Red.....	Green-blue
Orange.....	Cyan blue
Yellow.....	Ultramarine blue
Greenish-yellow.....	Violet
Green.....	Purple

These colors may be observed readily with a simple polariscope, where polarized light from a Nicol's prism (q.v.) falls upon a prism of calc-spar and glass, in which by virtue of the doubly refracting power of the calc-spar (see LIGHT, paragraph *Double Refraction*) there is furnished a double image of the aperture through which the polarized light from the Nicol passes. If a strip of selenite be interposed between the polarizing prism and the crystal, the two images referred to will be different in color, one shade being complementary to the other. These strips of selenite may be of various thicknesses, and will thus produce various colors. This follows from the well-known principle that, when plane-polarized light is transmitted through a thin plate of a doubly refracting medium, the ordinary and extraordinary rays when examined with a doubly refracting analyzer will give images brightly colored, which where they overlap are white, showing that the two colors are complementary. If two complementary colors are combined—and it must be remembered that the colors themselves, not the pigments, are here meant—

then white light is produced. This can be accomplished best, perhaps, with the Maxwell color disk where a disk of cardboard composed of segments of complementary colors is rapidly rotated. The impressions of the two colors follow each other so rapidly that the sensations are blended, and if the colors are used in the right proportions we have a gray tint produced, as the luminosity of the two colors either singly or jointly is not so great as that of a white surface with which it would be compared. Complementary colors vary with the light by which they are viewed, and are different when seen by gaslight from what they are in the daytime. The explanation is to be found in Young's theory, where the color-sensation is considered to be furnished by three groups of nerves corresponding to the red, green, and violet-blue waves. If all of these nerves are stimulated together, the sensation produced is that of white light. Consequently, a certain red acts on the red nerves while its corresponding complementary color, green-blue, would stimulate the other sets of nerves, and the result of all acting together would be the sensation of white light. For a thorough discussion of this subject, which may be appreciated by the general reader as well as the student of physics, consult Rood, *Modern Chromatics*, a new edition of which was published (New York, 1899) under the title of *A Text-Book of Color*. See VISUAL SENSATION.

COMPLEXION (OF., Fr. *complexio*, from Lat. *complexio*, combination, from *complecti*, to entwine, from *com-*, together + *plectere*, to weave). The color of the skin, existing in the epidermis and dependent upon certain pigment-cells. Those persons most exposed to the weather and least under the influence of civilization are usually of the darkest color. Light hair is the usual accompaniment of white and thin skin; while dark hair and dark complexions commonly go together. There does not appear to be any anatomical difference in the skins of persons of light and dark complexions; the differences are the result of temperature, climate, and exposure. The more decided differences in skin-color which may be called racial—the white of the Caucasian, the brown or olive of the Mongolian, the yellow or tawny of the Malayan, the red of the Amerind, and the black of the African and Australian—are apparently connected with deep-seated physiologic processes as well as hereditary causes; they are disseminated elsewhere. See SOMATOLOGY.

COMPLEX NUMBER. The steps in the growth of the number system of algebra may easily be illustrated by the roots of equations, thus:

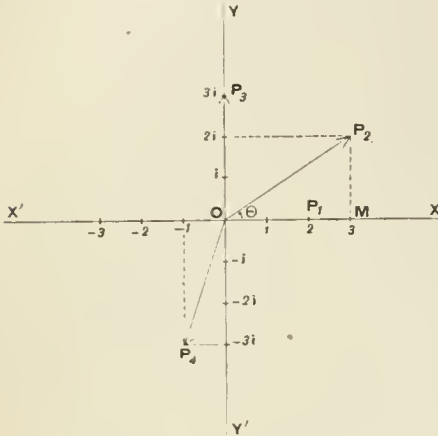
The solution of the equation $x - 3 = 0$ is 3, a positive integer which may be represented graphically on a straight line. The solution of the equation $3x - 2 = 0$ is $\frac{2}{3}$, a fraction which may also be represented graphically on a straight line. The solution of $x^2 - 2 = 0$ is $\sqrt{2}$, a surd which may be represented by the diagonal of a square whose side is 1. The solution of $x + 2 = 0$ is -2 , a negative number, which may be represented on a straight line in the opposite direction from that of the positive number. But the solution of

$x^2 + 2 = 0$ is $\pm \sqrt{-2}$ or $\pm \sqrt{2} \cdot \sqrt{-1}$ called an imaginary number. The symbol $\sqrt{-1}$

is commonly called the imaginary unit, and is represented by i . All numbers containing the factor i are called imaginary numbers, as opposed to real numbers: e.g.

$$\pm i, \pm 2i, \pm 3i, \dots, \pm \frac{2}{3}i, \pm \sqrt{2} \cdot i$$

are imaginaries. The algebraic sum of a real number and an imaginary is called a complex number; e.g. $1 + i$, $2 - 4i$, and in general $a + bi$. A complex variable is generally expressed by $x - yi$, in which x and y are real



variables. Complex numbers are represented graphically in a plane. In the figure the real numbers are laid off on the axis XX' in the usual way, and the coefficients of i on the axis YY' . The points in the plane corresponding to these coordinates represent the complex numbers. Thus, P_1 on the axis represents the real number 2, P_2 represents the complex number $3 + 2i$, P_3 represents $3i$, and P_4 represents $-1 - 3i$. Any point and the origin uniquely determine a line-segment, or vector, called the modulus of the complex number, and this may also be taken to represent the number. In the figure, the moduli are OP_1, OP_2, OP_3, OP_4 . In general, the modulus of a complex number $a + bi$ is the diagonal of a rectangle of sides a and b ; hence its absolute value is $\sqrt{a^2 + b^2}$. Thus, the modulus of $3 + 2i$ (OP_2 in the figure) is $\sqrt{9 + 4}$ or $\sqrt{13}$. The convention as to the direction of i is a reasonable one: for since multiplying $+1$ by -1 revolves it through 180° to the position -1 , therefore its multiplication by one of the two equal factors of -1 , viz. $\sqrt{-1}$, may be interpreted as revolving it through 90° . There are other sufficient reasons for this convention, which will be evident to one who studies the subject. The complex number is a directed magnitude; that is, it has both extension and direction in its plane. This is best understood by considering $a + bi$ in the form $r(\cos \theta + i \sin \theta)$, in which r is the modulus $\sqrt{a^2 + b^2}$, and θ is the amplitude. In the figure, $\cos \theta =$

$$\frac{a}{\sqrt{a^2 + b^2}}, \sin \theta = \frac{b}{\sqrt{a^2 + b^2}} \text{ (See TRIGONOMETRY.)}$$

This method of representing the complex number as a directed magnitude in a plane was at one time thought to be due to Argand, and hence the figure is often called Argand's diagram.

Two complex numbers which differ only in the sign of the imaginary part are called conjugates; e.g. $2 + 3i$ and $2 - 3i$, or, in general, $a + bi$ and $a - bi$. Complex numbers are subject to the associative, commutative, and distributive laws, and, when combined by the fundamental operations of algebra, yield no number not already defined. For $x + yi$ represents real numbers when $y = 0$, imaginaries when $x = 0$, and complex numbers when x, y are real and not zero. Hence, $x + yi$ becomes a convenient form for representing general numbers; and instead of saying that every equation has a root, which may be real, imaginary, or complex, we may say that every equation has a root $x + yi$. If, in plotting the successive moduli of a sum, the second modulus is drawn from the end of the first, the third from the end of the second, and so on, the result is a broken line which may be closed by connecting the last point with the origin. This vector is called the sum. Since no side of a polygon is greater than the sum of the remaining sides, the modulus of the sum of any number of complex numbers is not greater than the sum of their moduli. This is expressed symbolically thus:

$$|X_n| \leq |X_1| + |X_2| + \dots + |X_{n-1}|$$

Multiplying $r(\cos \theta + i \sin \theta)$ by $r'(\cos \theta' + i \sin \theta')$ and applying the formulas for the functions of the sum of two angles (see TRIGONOMETRY), the product is $rr'[\cos(\theta + \theta') + i \sin(\theta + \theta')]$. Hence, the product of the moduli of two complex numbers is the modulus of their product, and the sum of the amplitudes is the amplitude of the product. Similarly for n complex numbers. For brevity, let $\text{re } i\theta \equiv r(\cos \theta + i \sin \theta)$, then $r_1 \text{ re } i\theta_1 \cdot r_2 \text{ re } i\theta_2 \cdot \dots \cdot r_n \text{ re } i\theta_n = r_1 r_2 \dots r_n \text{ re } i(\theta_1 + \theta_2 + \dots + \theta_n)$. This is known as De Moivre's theorem. If each of the above numbers equals the first, $(r_1 \text{ re } i\theta_1)_n = r_1^n \text{ re } i n\theta_1$, or the n th power of the complex number. The

quotient of $r_1 \text{ re } i\theta_1$ by $r_2 \text{ re } i\theta_2 = \frac{r_1}{r_2} \text{ re } i(\theta_1 - \theta_2)$,

$$\text{and } \frac{1}{r_1 \text{ re } i\theta_1} = \frac{1}{r_1} \text{ re } i \frac{1}{\theta_1}.$$

By observing the changes in the modulus and amplitude, the results of any of these operations may be represented graphically. The variation of a function of a complex variable, $x + yi$, due to the variation of x and y , is very important in the theory of equations and functions. Thus the fundamental proposition that every equation has a root is a consequence of Cauchy's theorem which asserts that the number of roots of any equation comprised within a given plane area is obtained by dividing by 2π the total variation of the amplitude of the function corresponding to the complete description, by the complex variable, of the perimeter of the area.

The first appearance of the imaginary is found in the *Stereometria* of Hero of Alexandria (third century B.C.). Diophantus (supposed to have flourished in the fourth century A.D.) met these numbers in his algebraic work, but failed to give an explanation. Bha-kara (A.D. 1114) recognizes the imaginary, but pronounces the roots involving $\sqrt{-1}$ to be impossible. Cardan (1545), in his *Ars Magna*, was the first mathematician who had the courage to use the square roots of negative numbers in computation. Bombelli, Girard, and Descartes (q.v.) formulated rules

for the use of such quantities as $a + bi$ $\sqrt{-1}$, but founded no theory. Wallis (1685) made the first attempt to give a geometric interpretation. Euler (1770) still regarded these quantities impossible. Thus it was reserved for Casper Wessel (1797), a Norwegian surveyor, to invent a graphic treatment of complex numbers. His method is contained in a memoir, presented to the Royal Academy of Science and Letters of Denmark, entitled *On the Analytic Representation of Direction*. For the early development of the subject, however, credit must be given to Argand, Gauss, Servois, and others, since Wessel's article (published in 1799 by the Royal Academy of Denmark) did not appear in French until 1897, one hundred years after its presentation. Gauss did much to establish the underlying principles. Argand's memoir (1806), unquestionably an original and independent production, supplied the graphic theory that lay neglected in the work of Wessel. François, Servois, Geronne, and Cauchy did much to correct the errors of their predecessors and to generalize the theory of directed lines.

Complex number, being the most general type of algebraic number, has come to occupy the place of highest importance in modern analysis. It has led in recent times to the establishment of the theory of functions (q.v.) and quaternions (q.v.). Consult: Beman, "A Chapter in the History of Mathematics," in the *Proceedings of the American Association for the Advancement of Science* (Salem, 1897); Cauchy, *Cours d'analyse* (Paris, 1821); Warren, *A Treatise on the Geometric Representation of the Square Roots of Negative Quantities* (Cambridge, 1827); Chrystal, *Algebra*, part i. (Edinburgh, 1889); Hankel, *Vorlesungen über die complexen Zahlen* (Leipzig, 1867); Durège, *Theorie der Functionen einer complexen veränderlichen Grösse* (Leipzig, 1873), trans. by Fisher and Schwatt as *Elements of the Theory of Functions of a Complex Variable* (Philadelphia, 1896).

COMPLUVIUM. See ATRIUM; IMPLUVIUM.

COMPONÉ. kôm-pō'nâ (Fr., composed), or **GOBONY.** In heraldry, a term describing a field or charge bearing a row of small squares, consisting of alternate metals and colors.

COMPOSITÆ. kôm-pöz'î-tê (Lat. nom. pl., from *compositus*, p.p. of *componere*, to put together, from *com-*, together + *ponere*, to put, from *po-*, Gk. *ἀπό*, *apo*, off + *sincere*, to allow). An order of dicotyledonous plants, variously called the composite family, aster family, sunflower family, and sometimes divided and known as the chicory and thistle families, embracing nearly 1000 genera and more than 11,000 species, making it the largest family of flowering plants. Although a large order, the flowers of the Compositæ are so characteristic and distinctive as not to be confused with those of any other order, the only ones bearing even a superficial resemblance being Dipsacæ, represented with us by the teasel.

The flowers of the order Compositæ are rather small and are grouped together upon a common receptacle, surrounded by bracts which form a leafy or sealy involucre, so as to give the appearance of a single flower. The common term 'flower' is applied to the aggregation instead of to the individuals making up the so-called 'head.' The flowers, or florets, as they are usually

known, are often of two kinds, those of the central part being called disk florets, and those of the circumference ray florets. These often differ in size, shape, and color, and the disk florets are usually fertile, while those of the ray are often sterile, or at least without stamens. The calyx is united with the ovary, and its divisions crown the ovary with awns, teeth, bristles, etc., all of which are called the pappus (q.v.); or the pappus may be wholly wanting. The corolla is situated above the ovary, and is united into a tube (tubular), or may be strap-shaped (ligulate), both forms commonly occurring in the same flower, the tubular florets composing the disk, and the ligulate florets the rays of the 'flower.' The corolla may be, and usually is, divided at its summit into five teeth or lobes. The stamens are usually five in number, and are inserted upon the corolla, and are united together by their anthers into a tube around the single style, which is two-cleft at its summit. The ovary is one-celled and one-ovuled, the ovules ripening into a dry fruit called an akene or achene (q.v.). Growing among the flowers are often found numerous bracts which are spoken of as chaff or paleæ. When these are not present, the receptacle is said to be naked. The form of the receptacle may vary from flat, convex, conical, or, in some cases, elongated to the length of an inch or more. The form of the corolla, shape of the receptacle, presence and nature of the chaff, are all important characters in the classification of the members of this order. The plants are herbaceous, shrubby, or even trees, and are found in nearly all parts of the world where plant life exists to any extent, and they frequent almost every condition of soil and surroundings. The tree forms are confined to the tropics, many of the shrubby species occur in hot, dry regions, while the herbaceous species prevail in temperate climates, extending well within the colder zones. In general the leaves are alternate and without stipules, but are sometimes opposite or whorled; or they may all be radical, as in the dandelion, etc. Numerous systems of classification have been proposed from time to time, that of Hoffmann (with some modification) being the one most current at present. Hoffmann divides the order into two suborders—*Tubulifloræ*, in which the disk florets are never ligulate, and *Ligulifloræ*, in which all the florets are ligulate. The plants of the first subdivision do not bear any latex in their stems, while those of the second are conspicuous on account of the milky or reddish-colored juice which they exude when injured. The first suborder is by far the largest in number of species. The two great divisions are again subdivided into thirteen tribes, as follows: **TUBULIFLORE:** (1) *Vernonia*, represented by the genus *Vernonia*; (2) *Eupatoriæ*, embracing *Ageratum*, *Eupatorium*, and *Mikania*; (3) *Astereæ*, the principal genera of which are *Aster*, *Solidago*, *Erigeron*, *Bellis*, *Baccharis*; etc.; (4) *Inuleæ*, which contains among its prominent representatives the genera *Pluchea*, *Filago*, *Antennaria*, *Gnaphalium*, *Inula*, *Helichrysum*, etc.; (5) *Helianthæ*, represented in our flora by *Helianthus*, *Silphium*, *Iva*, *Ambrosia*, *Rudbeckia*, *Echinacea*, *Coreopsis*, *Bidens*, *Xanthium*, *Zinnia*, *Dahlia*, etc.; (6) *Heleniæ*, with *Actinella*, *Helenium*, *Tagetes*, *Gaillardia*, *Dysodia*, etc.; (7) *Anthemideæ*, which embraces *Achillea*, *Anthemis*, *Matricaria*, *Chrysanthemum*, *Tanacetum*, *Arte-*

misia; (8) *Senecionæ*, represented by Senecio, Petasites, Arnica, Cacalia; (9) *Calendulaceæ*, typified by Calendula; (10) *Arctoidæ*, represented by Arctotis, an African and Australian genus; (11) *Cynaræ*, which embraces the genera Artium, Carduus, Cnicus, Cynara, Onopordon, Centaurea, etc. (12) *Mutisicæ*, not found in the United States, but represented elsewhere by Mutisia, Gerbera, etc.; and *FIGULIFLOREÆ*, with (13) *Cichoricæ*, represented by Cichorium, Tragopogon, Pteris, Hieraceum, Leontodon, Taraxacum, Lactuca, Sonchus, Chondrilla, etc. When the large number of species of this family are considered, a small proportion only, aside from those cultivated for their flowers or foliage, are found to be of economic importance. Among the most important may be mentioned chicory, dandelion, lettuce, salsify, artichokes (both globe and Jerusalem), sunflowers, tansy, chamomile, etc. Many are grown for their flowers. When cultivated the disk flowers are often changed in form, and the flowers are then said to be doubled, as in the case of dahlias, zinnias, asters, chrysanthemums, coreopsis, etc. Medicinal properties are claimed for many, as arnica, wormwood, elecampane, artemisia, colt-foot, tussilago, blessed thistle, etc. The seeds of a number contain oil that is of importance, as the sunflower, madia, etc.

The plants of this order exhibit a number of interesting adaptations in their natural history. The Compositæ are generally considered as the highest expression of development in the plant world, and they exhibit a number of modifications by which they have become the most numerous and aggressive of all plants. In many genera the gradations between species are so confusing as to make their proper classification well-nigh impossible. The distribution of the fruit has been brought about by many special modifications. In the dandelion, thistle, and others, the calyx develops, after the fertilization of the flower, into a plumose pappus by which the fruits are scattered by the winds. In the tickseed and bur-marigold the achenes are crowned with several barbed awns that catch in the hairs of animals and the clothing of man, aiding materially in their wide dissemination. In the burdock and cockle-bur the involucre is furnished with curved hooks which serve to aid in the dispersal of these plants. Other seeds, such as those of the Madia, the tarweeds, are covered, especially upon their involucres, with a very thick adhesive exudation that adheres to anything with which the seeds come in contact, and these are carried away often to great distances.

The means devised for the fertilization of the flowers is admirably adapted to secure numerous progeny. The flowers being small and crowded together, several can take advantage of the visit of a single insect laden with pollen. Some are wind-pollinized, their close position aiding in it. The mechanism of the individual flower for pollination is curiously perfect. When the flower opens, the style, with its stigmatic surfaces closely pressed together, forces its way out through the stamen-tube, carrying the pollen out where it can come in contact with insect visitors or be blown away by the wind. At this time the flower is not ready for its own fertilization. When receptive, the style has protruded from the tube and the stigmas separate, curving backward. If they do not receive pollen from another flower

to thus secure the desired cross-fertilization, they continue to curl backward until they come in contact with the pollen, some of which still remains upon their own style, and they thus become self-fertilized. In this way the setting of seed is assured to every flower. In conclusion, the remarkable success of this order may be attributed to a number of factors, such as the massing of the flowers, resulting in greater conspicuousness, to attract insect visitors, one visitor fertilizing many flowers; a simple floral mechanism to protect and distribute the pollen, and the special devices described above to secure the dispersal of the seeds. See articles on various members of the order.

COMPOSITE NUMBERS. See PRIMES.

COMPOSITE ORDER. See COLUMN.

COMPOSITE SHIPS. Ships built with iron or steel frames and wooden planking. In some cases the framing is stiffened by keel-plates, stringers, deck-plates, longitudinals, etc. The planking is bolted to the frames, and sometimes additionally pinned edgewise to the planks on each side. It is almost invariably sheathed with copper as a protection against fouling—indeed, it is chiefly to provide against fouling that ships are composite built. See SHIPBUILDING.

COMPOSITION (from OF., Fr. *composition*, from Lat. *compositio*, connection, from *componere*, to put together). In painting, that ordered arrangement of light and shade, of color and line, which shall directly impress the beholder with the thought and idea the artist wishes to express. The most important requisite of composition is unity. Every object must form a harmonious part of the whole, and be in distinct relation to the rest of the picture. As Millet said: "A work should be all of a piece, and people and things should be there for an end." Whatever their color or shape, all objects in the picture should be seen under like conditions of light, shade, and atmosphere. There should be some object or objects of special interest, to which the remainder of the picture should be strictly subordinated.

The subject treated and the individuality of the artist usually determine the composition of a picture. There are, however, some generally accepted maxims in regard to linear composition which should be mentioned. The perpendicular line is one of dignity and severity, and its predominance in a picture produces a simple, majestic effect (e.g. the early Italian portraits). The predominance of the horizontal line produces an effect of repose or solemnity, as is seen in the composition of most landscapes. The flowing or waving line is the line of beauty and grace, and it is for this reason that the drawing of the human figure is esteemed so important.

There have been many theories of composition, more or less arbitrary. The Italians generally use the pyramidal composition, in which the Madonna forms the apex of the pyramid, with a balanced group of standing or kneeling saints on either side. As art advanced, they also used the oval composition, in which the figures form a circle on the canvas (e.g. Raphael's "Madonna della Sedia"), the arch (Correggio's "Coronation of the Virgin"), the diamond shape (Sistine Madonna), and others. In landscape the themes of composition were even more numerous. In modern composition there is greater freedom,

the artist following his own inclination. Nevertheless, he usually leans upon some well-established principles, although he may not be conscious of them, since analysis is the work of the critic rather than of the artist. Millet is an excellent example of a free and original method of composition in the modern sense. Consult: Van Dyke, J. C., *Art for Art's Sake* (New York, 1901); Blanc, *Grammaire des arts de dessin* (Paris, 1882); Burnett, *Practical Treatise on Painting* (London, 1880).

COMPOSITION AND RESOLUTION OF FORCES AND MOTIONS. See MECHANICS.

COMPOSITION WITH CREDITORS. In law, an arrangement made by a failing debtor with several or all of his creditors, by which they accept the payment of a percentage of their claims in full satisfaction and discharge of the whole. An agreement between a debtor and a single creditor that the latter will discharge the former from all liability upon the former's payment of a part of the debt is void by common law, because, it is said, this payment is no consideration for the creditor's promise to relinquish the balance of the debt, being only a payment of what the debtor already owed and was legally bound to pay. An agreement between a debtor and several or all of his creditors possesses an additional element. Such an agreement is binding upon all, it is said, because each creditor promises to release the balance of his claim, over and above the percentage paid to him, in consideration of such payment and also in consideration of the promises of other creditors to do likewise. It is held to be the substitution of a new agreement with different parties for an old debt. If any of the creditors entering into such a composition agreement stipulates secretly with the debtor for a preference to himself, his stipulation is void. Bankruptcy statutes often provide for and regulate composition proceedings between the bankrupt and his creditor. See BANKRUPTCY; CONTRACT.

COMPOST (OF. *composte*, It. *composta*, Portug. *composto*, mixture, from Lat. *componere*, to put together). A mixture of fertilizing materials which has been subjected to fermentation. Composts are usually prepared by mixing animal manures or other readily putrescible substances with peat (q.v.), straw, leaves, road-scrapings, mud, loam, etc., with a view to causing fermentation and chemical changes, which will render these substances more active as fertilizers than they were in their original condition. Similar results are sometimes brought about by the use of ashes, lime, marl (q.v.), alkali salts, etc. Frequently also preservative substances, such as gypsum, kainit, superphosphate (qq.v), etc., are added to prevent the loss of ammonia or of nitrogen in the free state, which is likely to occur during fermentation. Composting is thus not only a means of rendering the constituents of various more or less inert materials more available as plant food, but also of preventing loss of the most valuable constituent of manures, viz. nitrogen. A compost which was formerly quite popular consists of alternate layers of barnyard manure, 1 part, and peat, 1-5 parts, the proportion of the latter depending upon the fermentative power of the manure. In this mixture the peat prevents the loss of ammonia and the

valuable manure liquids, and the manure sets up a fermentation in the peat which greatly increases the availability of the inert nitrogen in which this material is comparatively rich. When lime, ashes, or lime and salt mixtures are substituted for manure in the peat compost, the alkaline character of these substances promotes the decomposition of the peat in much the same way as the manure. In case of the lime and salt mixture the reaction between the lime and the salt (NaCl) results in the formation of caustic soda (NaOH), which is especially active in bringing about decomposition of the peat. A recommended formula for this compost is 50 cords of peat, 100 bushels of lime, and 17 bushels of salt. Make a brine of the salt and slake the lime in it to a fine dry powder, using about one bushel of salt to six of lime, spread the slaked lime, while still hot, over the peat, which should be in layers about six inches thick. Continue the alternate layers of peat and lime until the heap is four to five feet high. By substituting muriate of potash for salt in the above mixture the same result is accomplished and at the same time a valuable fertilizing constituent, potash, is added to the manure. The fermenting compost heap has been utilized for the reduction of bones (q.v.) and ground mineral phosphates; and meat, fish, slaughter-house refuse, etc., are sometimes incorporated in it, but composts containing any considerable amount of the latter substances are likely to be very offensive. Moreover, these materials are less benefited by the process than more inert substances. Composting is an effective means of 'killing,' i.e. destroying the germinating power of cottonseed intended for use as a fertilizer. Innumerable formulas for composts have been proposed, some of which have attained considerable celebrity. Among these may be mentioned, in addition to the peat composts referred to above, Furman's formula for cotton, which is as follows: Barnyard manure, 750 pounds; cottonseed, 750 pounds; acid phosphate, 367 pounds; kainit, 133 pounds. The plan of composting these materials, which well illustrates the methods of composting in general, is briefly as follows: Put down on an impervious dirt floor first a layer of manure, then of cottonseed, and lastly of acid phosphate, in the proportions given, distributing the kainit throughout the different layers. Repeat the layers to any desired extent and cover the heap with absorbent earth. The heap should be kept moderately moist, and if made in the autumn should stand until spring, when it is dug down, mixed, and applied. Although composting furnishes a valuable means of converting waste materials of the farm into more active and better-balanced fertilizers, the labor involved is so great as to render the practice of doubtful economy for general agricultural purposes, especially since the general introduction of the more concentrated and active commercial fertilizers. (See MANURES AND MANURING.) Composts have been recommended especially for use on grass lands and on stiff soils, or on those deficient in humus. They find their greatest usefulness, however, in horticultural operations—for plant-beds, potting, and for use on vines, fruits, etc., which might be injured by more concentrated fertilizers. Perennial plants, or those having long periods of growth, will utilize the fertilizing matter of composts to the best ad-

vantage. Composts are not so well suited to the forcing of quick-growing crops as commercial fertilizers. For specific directions for preparing different kinds of composts, consult: Dana, *Muck Manual for Farmers* (4th ed., New York, 1858); Storer, *Agriculture in Some of its Relations with Chemistry* (7th ed., New York, 1897); Johnson, *Peat and its Uses as Fertilizer and Fuel* (New York, 1866); Sempers, *Manures: How to Make and How to Use Them* (Philadelphia, 1893).

COMPOSTEL'LA, ORDER OF SAINT JAMES OF, or ORDER OF SAINT JAMES OF THE SWORD. An order of knighthood in Spain. To defend the multitude of pilgrims that thronged to the shrine of Saint James at Compostella (Santiago), in Galicia, Spain, from the Moors, thirteen noblemen formed themselves into a military Order, under the auspices of the Pope, in 1175. With time the Order rose to immense power and wealth. It fought valorously in all the Moorish wars, and exercised great political influence. But its rich towns and abbeys tempted Ferdinand and Isabella, who took possession of its property in 1493 and held it until 1522, when a Papal bull vested the permanent grand-mastership in the Crown.

COMPOUND, CHEMICAL. See CHEMISTRY.

COMPOUND ANIMALS. Such animals as are made up of a number of morphological units, called *persons*, which are organically connected throughout life. The connection results from a budding process, in which the buds never become separated from the parent stock. Compound animals are found among protozoans, sponges, coelenterates, certain flatworms (planarians and tapeworms), bryozoans, some annelids (*Syllis*), and tunicates. The degree of connection varies. When it is loose the complex is called a stock; when close a corm, as in sponges. Most compound animals are sessile, but the siphonophores, flatworms, and some tunicates swim free. The opposite of this term is 'simple animals.'

COMPOUND DUPE TIME. See TIME.

COMPOUND FRACTURE. A fracture of a bone accompanied by a wound which opens from the surface of the body to the break in the bone. Infection of the bone being thus rendered possible, a compound fracture is more serious than a simple fracture. See FRACTURE.

COMPOUNDING OF FELONY. The offense of taking value for forbearing to prosecute a felony. This offense is punishable with fine and imprisonment. Compounding of informations upon penal statutes, and compounding of misdemeanors, are also illegal, and are punishable in a lighter degree. In Great Britain the compounding of misdemeanors is permitted in some cases with the leave of the court, especially in the case of a misdemeanor affecting private (and not public) rights. Accepting a promissory note signed by a party guilty of larceny, as a consideration for not prosecuting, is enough to constitute the offense; but the mere retaking of stolen goods by the owner is not an offense, unless it is agreed that the thief is not to be prosecuted. A note or other obligation given in consideration of stopping a criminal prosecution or an agreement not to prosecute is void. See CRIMINAL LAW, and consult the authorities referred to there.

COMPOUND INTEREST. See INTEREST.

COMPOUND MICROSCOPE. See MICROSCOPE.

COMPOUND TRIPLE TIME. See TIME.

COM'PRADOR' (Sp., Port., purchaser). In China, Japan, and the Philippines, a man who contracts for the supply of provisions to ships.

COMPRESSED AIR. See POWER TRANSMISSION; AIR COMPRESSOR; COMPRESSED-AIR ENGINE; COMPRESSED-AIR LOCOMOTIVE; PNEUMATIC TOOLS; PNEUMATIC DISPATCH.

COMPRESSED-AIR ENGINE. An engine using as a motor fluid air to which a degree of energy has been imparted by compression by mechanical means. When atmospheric air is compressed in an air compressor (see AIR COMPRESSOR) energy is stored in it which is available for work in a piston motor just as in the energy stored in steam. Any form of engine which will operate with steam as a motive fluid will also operate with compressed air as a motor fluid, that is, a steam-engine will become a compressed-air engine simply by disconnecting the steam boiler and substituting a receiver or reservoir of compressed air. Compressed air is, however, employed to replace steam only under those conditions in which it is necessary to transmit the motor fluid to motors located at scattered points some distances from the source of supply. The reason for this is that while it is not possible to convey steam through pipes or to carry it in inclosed vessels for long distances without a great loss of energy due to condensation, it is practicable to do this with compressed air, with a comparatively small loss of energy if the air be heated before it is delivered to the motors at the end of its journey. Hence, compressed-air engines are practically always motors of special forms for performing special operations, and are usually of small size. For descriptions of the various special forms of compressed-air engines in common use, see DRILLS; PNEUMATIC TOOLS; POWER TRANSMISSION; STREET RAILWAYS.

COMPRESSED-AIR LOCOMOTIVE. A locomotive engine in which air under pressure takes the place of steam as the propulsive force. Compressed-air locomotives occupy a rather limited field of usefulness at present, their chief applications being street-railway propulsion on a limited scale, mine, quarry, and tunnel haulage and haulage around cane plantations, saw-mills, cotton-presses and warehouses, textile-works, and powder-mills, where the risk of fire has to be carefully avoided. Structurally, a compressed-air locomotive has the same form of propelling mechanism as a steam locomotive, but in place of the boiler there are tanks for holding compressed air, these tanks being recharged at intervals at a stationary air-compressor plant. A brief description of the use of compressed-air locomotives for street-railway propulsion and for mine haulage will give a fair idea of the two distinctive classes of these motors.

STREET-RAILWAY LOCOMOTIVES. Numerous attempts have been made, in the United States, to employ compressed-air locomotives for propelling street-railway cars; but, with the exception of a few short lines operating under special conditions, these attempts have all resulted in commercial failures. Probably the most extensive

experiments have been conducted in New York City, on some of the railway lines crossing the city from east to west. In all of these experiments a locomotive car has been employed carrying the tanks underneath the seats or under the floor of the car. In Europe the Mekarski system of compressed-air street-car locomotion has been used apparently with considerable success in Paris, France, and Berne, Switzerland. A special feature of the Mekarski system is the heating of the air, to maintain it at a constant temperature, by passing it through superheated water at 330° F. The air thus becomes saturated with steam, which subsequently partly condenses, its latent heat being absorbed by the expanding air. The pressure used at Berne in the car reservoirs is 440 pounds per square inch. The engine is constructed like an ordinary steam tramway locomotive, and drives two coupled axles spaced 5.2 feet apart. It has a pair of outside horizontal cylinders, 5.1 by 8.6 inches; four coupled wheels, 27½ inches in diameter. The total weight of the car, including compressed air, is 7¼ tons. The storage-tanks consist of ten sheet-iron cylinders with an aggregate capacity of 64¼ feet of compressed air. The cars will run for four miles without refilling the reservoirs. On the Paris lines the pressure used is 547 pounds, and the cars make trips of seven miles without refilling the reservoirs.

MINING LOCOMOTIVES. As generally constructed, the air for mining locomotives is stored in one or two steel tanks having a cubic capacity designed for the length of run, weight of train, grades, etc. These tanks usually occupy the space that the boiler does on an ordinary steam-locomotive. The air from the main tank or tanks is conducted through copper-pipe connections to an auxiliary reservoir of suitable diameter. The pressure in this auxiliary tank can be regulated (usually 150 pounds) anywhere from 30 pounds up to 300 pounds, as required. The air is reduced and controlled from the main tank by a reducing-valve and stop-valve, and can be regulated to any pressure at a moment's notice; when once set, a constant pressure is maintained in the auxiliary reservoir. The air is fed to the engine cylinders from the auxiliary reservoir. Compressed-air locomotives for industrial uses are built substantially the same as mining locomotives.

From the preceding it will be seen that the two types of compressed-air locomotives are, the compressed-air motor car for street-railway propulsion and the compressed-air locomotive proper for mine, plantation, and factory haulage. In both forms the prime motive power is steam, whose energy as it comes from the boiler is employed first to drive the air compressors; and, second, as stored in the compressed air, to propel the car motor or locomotive proper. See AIR COMPRESSORS and COMPRESSED-AIR ENGINE.

COMPRESSED-AIR TREATMENT. A term applied to the use of air under pressure for therapeutic purposes. The treatment is administered in one of the following two ways: (1) by causing the patient to enter an air-tight chamber, in which air is forced under pressure till the desired density is obtained; (2) by causing the patient to enter a cabinet in which he is seated in such a position as to receive into his mouth the end of a tube which, passing through the front of the cabinet, connects the cavity of his

lungs with the outside atmosphere, while an apparatus on the roof of the cabinet is so arranged as to pump air out of the cabinet. In the air-tight room, the pressure upon all parts of the patient's body, including the lung-cavity, is the same. In the cabinet, the pressure within the lung-cavity is many times greater than on the rest of the body, thus causing great expansion of the lungs and chest. The latter treatment relieves collapse of pulmonary vesicles and consolidations, in many cases; the former treatment is said to cause increased absorption of oxygen and an improved function of the mucous membrane of the respiratory tract. Both methods of treatment are used in cases of tuberculosis, and the former also in chronic bronchitis and asthma, at certain water-cures. See TUBERCULOSIS; CAISSON DISEASE.

COMPRESSIBILITY (from Lat. *compressus*, p.p. of *comprimere*, to compress, from *com-*, together + *primere*, to press). That property of bodies by which they admit of being pressed into less space than they otherwise occupy. It is measured by the relative change of volume produced by the application of unit pressure. The particles composing bodies are in all cases at greater or less distance from one another; and whatever brings the particles closer together diminishes the volume or bulk of the body. This may be effected by various agencies, as, for example, by the withdrawal of heat, but the effect is called compression only when it is caused by mechanical force, as by pressure or by percussion. All bodies are compressible, but in different degrees. Solids and liquids were at one time believed to be incompressible; more accurate experiments, however, have proved that this is not the case; water, for instance, subjected to a pressure of 15,000 pounds to the square inch, loses one-twentieth of its volume. Gases, on the other hand, are strikingly compressible, and by means of a common air-pump a very large amount of air can be forced into the space of one cubic inch. The variation of the volume of a gas with the pressure is expressed by the law of Boyle and Mariotte. See GASES; MOLECULES—MOLECULAR WEIGHTS.

COMPRESSOR. An instrument used on ship-board for temporarily checking the running of the anchor-chain. It consists usually of a curved arm pivoted at one end and arranged to be swung across the under side of the chain-pipe through the deck and grip the chain by pressing it against the lip of the pipe. The term was also applied to an attachment to old-type guns for checking the recoil by squeezing two or more surfaces together and thus increasing the friction.

COMPRESSOR, AIR. See AIR COMPRESSOR.

COMPROMISE MEASURES OF 1850, or **OMNIBUS BILL.** A name popularly given to a series of measures passed by the United States Congress in 1850, directed to a general settlement of certain questions arising out of the struggle over slavery. The affirmation of American rights in the Oregon territory, by the Treaty of 1846 with England, and the acquisition of still larger territories from Mexico by the Treaty of Guadalupe-Hidalgo (q.v.), made urgent the problem of providing suitable governments for this territory, and at the same time made acute the controversy between North and South over the securing of acceptable provisions concerning

slavery in the statutes organizing such governments. One phase of this controversy ended with President Polk's approval, August 14, 1848, of a bill providing for the erection of territorial government in Oregon with a prohibition against slavery. With reference to the territory acquired from Mexico, the problem was complicated by the fact that Mexico had abolished slavery in her dominions, by the question whether the line of the Missouri Compromise (q.v.) extended to the Pacific, and also by the question whether Congress might admit into the Union a State which had not passed through the Territorial stage of organization. The necessity of an early decision was emphasized by the sudden peopling of much of this territory, incident to the discovery of gold. Under such circumstances Henry Clay offered in the Senate, on January 29, 1850, a general scheme of adjustment, which provided: that California should be admitted as a State with no restriction as to slavery; that Territorial governments should be created in the other portions of the Mexican cession without reference to slavery; that trading within the District of Columbia in slaves brought there for purpose of sale should be forbidden; that there should be a more stringent fugitive-slave law; and that Texas should release all claims on New Mexico in return for the assumption by the National Government of the old Texan debt. These proposals were attacked both by the Southern friends of slavery and by the more extreme anti-slavery element at the North. After several weeks of heated debate, including the last speech of Mr. Calhoun (q.v.) and the famous Seventh of March speech of Mr. Webster (q.v.), the whole matter was referred to a committee of thirteen, from which committee, on May 8, Mr. Clay reported three bills. The first provided, in addition to details as to the debt and boundary of Texas, for the admission of California with its anti-slavery Constitution, and for the Territorial organization of Utah and New Mexico in such form that slavery should be allowed in those Territories. The second bill provided for a modified fugitive-slave law. The third bill provided for the abolition of the slave-trade in the District of Columbia. Three months even then were occupied with animated and protracted discussions, with the result that the whole scheme of compromise seemed to have proved a failure. Mr. Fillmore, however, having succeeded to the Presidency upon the death in July of President Taylor, adopted a policy more favorable than had his predecessor to the measures proposed, with the result that practically the whole of Clay's plan eventually became law, although divided into several statutes. The Senate passed the bill for the organization of Utah on August 1, that concerning Texas on August 9, that for the admission of California on August 13, that concerning New Mexico on August 15, the new fugitive-slave law on August 26, and, finally, the law prohibiting the slave-trade in the District of Columbia on September 16. Before the end of September, all these bills had passed the House and had been signed by the President. The arrangement thus effected was accepted by both parties in the campaign of 1852, in the 'finality' planks of their platforms, and the slavery question was generally regarded as settled. The quiet was broken abruptly, however, and the whole controversy renewed with in-

creased bitterness when Stephen A. Douglas (q.v.) introduced his bill for the organization, in 1854, of Kansas and Nebraska, and thus precipitated the battle anew both on the fields of Kansas and in the halls of Congress.

In the first volume of Rhodes, *History of the United States from the Compromise of 1850* (new ed. New York, 1901), a careful review is given of all the circumstances connected with this famous compromise, including sketches of the chief participants in the debates. A shorter review of the situation is given in the fifth volume of Schouler, *History of the United States Under the Constitution* (Washington, 1889). The lives of statesmen of the period should also be consulted. See SLAVERY.

COMPTON METER. See CALCULATING MACHINES.

COMPTON, HENRY (1632-1713). An Anglican bishop of Oxford (1674) and of London (1675). He was born at Compton Wyngates, and was educated at Oxford. He was the tutor of the daughters of James II., Mary and Anne, who through his teachings became attached to the Protestant faith. In 1686, at the instigation of James, he was suspended by the high court of ecclesiastical commission from further exercises of episcopal functions, on the alleged ground of having permitted the preaching of controversial sermons within his dioceses. This suspension was reversed in 1688. Compton steadfastly held to the Protestant faith, and he crowned William III. He presided over the Upper House of Convocation in 1689, and assisted in the revision of the liturgy.

COMPTROLLER, or CONTROLLER (OF, *contrôleur*, Fr. *contrôleur*, from ML. *contratorulator*, keeper of a check roll). An officer who keeps financial accounts, or sees that they are properly kept and audited. In the United States Treasury Department the Comptroller of the Treasury supervises and reviews the actions of the various auditors of the Treasury, upon appeal; advises the heads of departments as to constructions of laws; and countersigns all warrants of the Secretary of the Treasury. The Comptroller of the Currency has charge of the execution of the laws relating to the issue and regulation of the national currency, secured by United States bonds; and has a general supervision of the national banks. State and municipal comptrollers in the United States have duties similar to those of the Federal officials.

COMPULSION. See COERCION; DURESS.

COMPURGATION (Lat. *compurgatio*, purification, from *compurgare*, to purify, from *com-*, together + *purgare*, to purge, from *purus*, pure + *agere*, to perform). An ancient method of proof in legal proceedings. It consisted in the purgation, that is, the purging or clearing, of a defendant by the sworn oaths of a certain number of persons who knew him. The procedure was singular in this, that the witnesses swore, not to their knowledge of the fact in issue, but to their faith in the defendant. The importance of the practice consists in the fact that it was a device of primitive law for mitigating the harshness of ordinary legal procedure. Thus, if the issue was one that would ordinarily subject the defendant to trial by battle or the horrors and uncertainties of the ordeal, he was

permitted to 'wage his law,' i.e. to give security to appear and abide by the results of a regular trial. Under ordinary circumstances, the oath of the defendant, supported by those of his eleven compurgators, was conclusive and resulted in clearing him. The procedure was available, in many forms of civil suit and in criminal proceedings, where the accused was on trial for the first time. Compurgation was employed as a part of the regular procedure of the ecclesiastical courts throughout Europe in the Middle Ages. It existed among the Anglo-Saxons, and was in use in the courts of the common law in England until it was gradually superseded by the jury system. Though long obsolete, it was revived in England in an action of debt as late as 1824. (*Ring vs. Williams*, 8 Barn. and Cress. 5387.) It was not until 1833 that it was finally abolished by act of Parliament (2 and 3 Will. IV. ch. 42, § 13). It never existed in the legal procedure of the United States or of the English Colonies in America. See JURY; OATH; PROOF; WITNESS. The procedure is elaborately discussed by Blackstone, *Commentaries on the Laws of England*. See also Underwick, *The King's Peace: A Historical Sketch of English Law Courts* (London, 1895); Stephen, *History of the Criminal Law of England* (London, 1883); Pollock and Maitland, *History of English Law* (2d ed. Boston, 1899).

COMSTOCK, ANTHONY (1844—). An American reformer, born in New Canaan, Conn. He was educated at high schools in his native State, and during the Civil War served in the Union Army from 1863 to 1865. Afterwards he became an active worker in the Young Men's Christian Association in New York City, and upon the organization of the Society for the Suppression of Vice in that city (1873), was appointed chief special agent. Since that time he has attained considerable prominence by his vigorous crusade against such books, papers, pictures, and establishments as he considers injurious to the public morals. He has published: *Frauds Exposed* (1880); *Traps for the Young* (1883); *Gambling Outrages* (1887); *Morals Versus Art* (1887); and numerous magazine articles relating to the same class of subjects.

COMSTOCK, CYRUS BALLOU (1831—). An American soldier and military engineer. He was born in West Wrentham, Mass., graduated at West Point in 1855, was appointed lieutenant-engineer, and from 1859 to 1861 was assistant professor of natural and experimental philosophy at the Military Academy. On the outbreak of the Civil War he was assigned to active duty as first lieutenant of engineers, and for some time was one of the assistant engineers engaged in the construction of defenses at Washington. He was assistant to the chief engineer of the Army of the Potomac from March to June, 1862; was senior engineer on General Sumner's staff in June and July; served as a member of the engineer battalion in the Maryland campaign; and from November, 1862, to March, 1863, was chief engineer of the Army of the Potomac. He was subsequently engaged in the siege of Vicksburg, was chief engineer of the Army of the Tennessee from July to October, 1863; was assistant inspector-general of the Division of the Mississippi from November, 1863, to March, 1864; and was senior aide-de-camp to General Grant from

March, 1864, to July, 1866. At the close of the war he was brevetted major-general of volunteers and brigadier-general in the Regular Army, and from July, 1866, to May, 1870, was aide-de-camp to the General-in-Chief, with the rank of colonel. Afterwards for several years he was superintending engineer of the geodetic survey of the Northern and Northwestern lakes, and in addition has been engaged as engineer on many important Government works. In 1888 he became colonel in the engineer corps, and was retired from active service in 1895. He has published: *Notes on European Surveys* (1876); *Survey of the Northwestern Lakes* (1877); and *Primary Triangulation United States Lake Survey* (1882).

COMSTOCK, GEORGE CARY (1855—). An American astronomer, born at Madison, Wis. He received his education at the University of Michigan and spent several years studying and practicing law, at the same time studying mathematics and astronomy. In 1881 he was appointed assistant astronomer at the Washburn Observatory in the University of Wisconsin. In 1885 he was made professor of mathematics at the Ohio State University, but in 1887 returned to the University of Wisconsin as associate director of the observatory, of which he was afterwards made head director. Comstock is a member of many scientific bodies, including the National Academy of Sciences. His published works include: *Method of Least Squares* and *Publications of the Washburn Observatory*.

COMSTOCK, JOHN HENRY (1849—). An American entomologist, born at Jaynesville, Wis. He was educated at Cornell University, where he became first instructor, then assistant professor, and, in 1882, professor of entomology and general invertebrate zoölogy. From 1878 to 1881 he was United States entomologist. In 1891 he became non-resident professor of entomology at Leland Stanford, Jr., University. Comstock is one of the most influential of American entomologists; his investigations deal with the morphology, classification, and economic relations of insects. In this work he has been assisted by his wife, Anna Botsford Comstock, who is herself an entomologist, and prominent in the educational movement emanating from Cornell University toward the general extension of nature study. His important publications include: *Report on Cotton Insects* (1879); *Annual Report of the Entomologist* (1879-81); *Introduction to Entomology*, part i. (1888); *Evolution and Taxonomy* (1893); *A Manual for the Study of Insects* (with his wife, Anna Botsford Comstock, 1895); *The Wings of Insects* (with J. G. Needham, 1897).

COMSTOCK, JOHN LEE (1789-1858). An American author of text-books. He was born at Lyme, Conn., and after a common-school education took up the study of medicine. He served as assistant surgeon in the War of 1812; and at its close settled in Hartford, where he devoted himself to writing and the preparation of text-books on the various sciences and history. His *System of Natural Philosophy* (1831) reached a sale of 900,000 copies, while other popular works from his pen were an *Introduction to Mineralogy* (1832); *History of the Precious Metals* (1849); and *History of the Greek Revolution* (1828).

COMSTOCK, THEODORE BRYANT (1849-1901). An American geologist, born at Cuyahoga Falls, Ohio. He graduated at the Pennsylvania State College in 1868, and at Cornell in 1870, and in 1873 accompanied Capt. W. A. Jones's Wyoming and Yellowstone Park expedition as geologist. From 1875 to 1879 he was professor of geology and paleontology at Cornell, where he established the department of economic geology. He acted in 1879-84 as general manager of a mining company at Silverton, Cal., and from 1884 to 1889 occupied the chair of mining engineering and physics at the University of Illinois. He was assistant State Geologist of Texas in 1889-91; in the latter year founded the Arizona School of Mines, which he directed until 1895, and from 1893 to 1895 was president of the University of Arizona. In 1886 he was elected secretary of the geological and geographical section of the American Association for the Advancement of Science. He published an *Outline of General Geology* (1878); *Classification of Rocks* (1877); and other works.

COMSTOCK LODGE. A remarkable compound fissure vein, rich in gold and silver, located in Storey County, Nev., on the eastern slope of Mount Davidson, a northeastern spur of the Sierras, at a point about 20 miles east of the California State line. Its discovery in 1859, when it received the name Washoe, created great excitement and led to the building up of Virginia City. The vein is about four miles in length, and varies in width from zero at the ends to 3000 feet at the middle point. It occupies a zone of displacement in igneous rocks, chiefly andesites of Tertiary age. The ore, which is of high grade, containing both silver and gold in proportion of three of the former to two of the latter, occurs in great pockets known as bonanzas, chiefly along the eastern portion of the vein. The excavations along this fissure vein have been carried to great depths, approximating 3500 feet, until operations became difficult through the inflow of hot water with a temperature of 170° F. The Sutro Tunnel, with a length of four miles, was driven with a view to draining this water, but with only partial success. The richness of the ore of this lode may be realized from the value of the product, the total value during the years 1860-90 having been \$340,000,000; the greatest output for a single year was \$38,000,000 in 1877. Since 1890 the production has declined.

Besides its economic value, the Comstock Lode is of great interest in other directions. One of the earliest classifications of igneous rocks (q.v.) was attempted in connection with the study of the geologic relations of the ore bodies by Von Richthofen in 1868; and Van Hise, Iddings, and Becker have at a later period perfected the modern classification of igneous rocks with aid of considerable information derived from the Comstock Lode and Sutro Tunnel. Also many important observations have been made on the relation between the size of grain and the rate of cooling, and upon the rate of development of crystallization in igneous rocks. Again, experiments have here been carried on by Carl Barus with the object of determining the temperature variations and electric manifestations in the deeper workings. For more precise information on the geologic features and methods of mining of the Comstock Lode, the reader is referred to the two following works: Becker, "Geology of the

Comstock Lode and Washoe District," with folio atlas; being *Monograph of the United States Geological Survey*, vol. iii. (Washington, 1882); Lord, "Comstock Mining and Miners," *Monograph of the United States Geological Survey*, vol. iv. (Washington, 1883).

COMTE, KÖNT, ISIDORE AUGUSTE MARIE FRANÇOIS XAVIER (1798-1857). A celebrated French philosopher, the founder of the positive philosophy, or Positivism (q.v.). He was born at Montpellier, and educated at the Ecole Polytechnique in Paris, from which he was expelled for his part in a protest of students against one of the instructors. From 1816 he supported himself by tutorial work. In Paris he met Saint-Simon, with whose theories he was at first greatly charmed, but from whose influence he broke away in 1824. In the following year he married Caroline Massin, but the union was unhappy. In 1826 he began a course of lectures at his own house on his system of philosophy, and had among his hearers such men as Humboldt and Blainville. Excessive work, however, ruined his health, and after the third lecture he became insane, was taken to an asylum, and tried to commit suicide. Thanks to the care of his mother and wife, he soon recovered the use of his faculties, and took up his studies and lectures again. In 1835 he got a position as examiner for entrance to the Ecole Polytechnique, which he held for some ten years, after which he was largely supported by his pupils and admirers. John Stuart Mill, with whom Comte had been in correspondence for some time, induced some wealthy English friends, Grote among them, to advance about \$1200 to Comte in 1845, and Grote sent a small sum to him afterwards. In 1848 Littré headed an appeal for a public subscription for the benefit of Comte, on the proceeds of which he subsisted for the remainder of his life. In 1845 he met Clotilde de Vaux, whose husband was serving a life sentence, and conceived an extravagant affection and admiration for her. The relation, which seems to have been platonic, was broken by her death a year later, after which Comte had a second attack of mental alienation. His death took place on September 5, 1857.

Comte published a number of important philosophic works, the most famous being his *Cours de philosophie positive* (6 vols., 1830-42), of which a condensed English translation by Harriet Martineau, approved by the author, appeared in 1853. Other works were: *Traité élémentaire de géométrie analytique* (1843); *Traité d'astronomie populaire* (1845); *Système de politique positive* (4 vols., 1851-54; English translation, London, 1875-77); *Catéchisme positiviste, ou sommaire exposition de la religion universelle* (1852). Comte's central and governing doctrine is that the human race, like the individual, necessarily passes through three intellectual stages: (1) The theological, in which a supernatural origin is sought for all phenomena, and the *deus ex machina* is the only explanation of events. (2) The metaphysical, in which the sensuously supernatural is set aside as incredible, and an effort is made to demonstrate the existence of "abstract forces or entities supposed to inhere in various substances, and capable of engendering phenomena." (3) The positive, in which the mind affirms the futility of both theological and metaphysical in

quiries, abandons all vain search after the causes and essences of things, and "restricts itself to the observation and classification of phenomena, and to the discovery of the invariable relations of succession and similitude which things bear to each other—in a word, to the discovery of the laws of phenomena." This last is the stage at which Comte conceived Europe to have arrived. Theology and metaphysics are alleged to be in their dotage, and all the anarchy of modern life to arise from the presence of these disturbing elements. To deliver us from their hurtful influence, Comte employs the principles of Positivism to organize a new social doctrine, which shall embrace the entire wants of man as an intellectual and emotional being. He thus aims at being the founder, not only of a new philosophy, but also of a new religion, and even assumed the title of *Fondateur de la religion de l'humanité*. See POSITIVISM; and consult: Littré, *Auguste Comte et la philosophie positive* (Paris, 1877); Mill, *Comte and Positivism* (London, 1865); Caird, *The Social Philosophy and Religion of Comte* (Glasgow, 1885); Gruber, *August Comte, sein Leben und seine Lehre* (Freiburg, 1889); Robinet, *Notice sur l'œuvre et sur la vie de Comte* (Paris, 1860). The first volume of Fiske, *Outlines of Cosmic Philosophy* (Boston, 1874), contains a thorough and noteworthy examination of Comte's system.

COMTE, kônt, PIERRE CHARLES (1825-95). A French artist, born at Lyons. He was a pupil of Robert Fleury, and for a long time imitated that master's loud but effective coloring. His first picture of importance was the "Visit of Charles IX. to Coligny, Wounded Two Days Before Saint Bartholomew" (1851). His compositions are almost entirely historical and are in many of the French museums. In the Corcoran Gallery at Washington, D. C. there is "A Scene at Fontainebleau" by him. His masterpiece, "Henry III. and the Duke of Guise" (second-class medal, 1855), is in the Luxembourg. His later coloring is sober, but his drawing is vigorous, and his conception always just and elevated, if not essentially dramatic.

COMTE DE BOURSOUFLE, kônt de hōōr'sōōf'l', LE (Fr., the Count of Boursoufle). A comedy by Voltaire, produced in public, posthumously, in 1862. It had been privately acted, however, at the Château de Cirey in 1734, and again at the Château d'Anet in 1747, under the title of *Quand est-ce qu'on me marie?* It was drawn from Vanbrugh's *Relapse*.

COMTE DE PARIS, de pâ'rê'. See PARIS, LOUIS PHILIPPE ALBERT D'ORLÉANS, COMTE DE.

COMTE ORY, kôn tô'rê', LE (Fr., the Count Ory). The title of an opera, the music of which is by Rossini and the libretto by Scribe and Delestre-Poirson (1828). Italian and French productions were given in London in 1829 and 1849 respectively.

COMTESSE D'ESCARBAGNAS, kôn'tēs' dē'skâr'bân'yās'. LA (Fr., the Countess of Escarbagnas). A comedy by Molière (1671), pursuing the satire on French county life which forms the subject of *M. de Pourceaugnac*.

COMUS (Lat., from Gk. *Kōmos*, *Kōmos*). A character which appears on Greek vases of the end of the fifth century n.e., and later as one of the companions of Dionysus, often as a satyr. Philostratus, in the third century A.D., describes

Comus as a winged youth slumbering in a standing attitude, his legs crossed, his countenance flushed with wine, his head sunk upon his breast, his left hand feebly grasping a hunting-spear, his right an inverted torch. Milton in his poem has represented Comus as born from the loves of Bacchus and Circe, "much like his father, but his mother more;" a sorcerer, who gives to travelers a magic draught that changes the human face into the "brutal form of some wild beast," and, hiding from them their own foul disfigurement, makes them forget all the purities of life, "to roll with pleasure in a sensual sty."

COMYN, kûm'in. A family which rose to great power and eminence in Scotland after the Norman Conquest. The name is also spelled Comin, Comines, or Cumin.—ROBERT DE COMYN, the founder of the family, was probably from Flanders, and followed William the Conqueror to England. He was made Earl of Northumberland in 1068. In 1069 he was sent to reduce the provinces of the north. He seized Durham, but the people rose against him, and he perished in the flames of the bishop's palace. The family became most prominent in the thirteenth century.—WILLIAM COMYN, who died in 1233, obtained the earldom of Buchan by marriage. WALTER, one of his sons by his first marriage, became Earl of Monteith. After the accession of Alexander III. of Scotland, Walter practically ruled the kingdom till 1255. He died in 1258.—ALEXANDER, Earl of Buchan, his half-brother, by marrying a daughter of the Earl of Winchester, acquired, in 1270, the high office of Constable of Scotland, with great estates in Galloway, Fife, and the Lothians. He was the most powerful noble in Scotland, until his death, in 1289. Within a quarter of a century, however, this great house suffered such utter misfortune that, in the words of a contemporary chronicle, "there was no memorial left of it in the land, save the orisons of the monks of Deer" (a monastery founded by William Comyn, Earl of Buchan, in 1219). The Comyns perished in the memorable revolution which placed Bruce on the throne of Scotland. Their chief, the Lord of Badenoch, was in 1291 an unsuccessful competitor for the crown, as a descendant, through King Donald Bane, of the old Celtic dynasty. His son, Red JOHN COMYN, was one of the three wardens of Scotland, and distinguished himself by his gallant resistance to the English. He fell under Bruce's dagger, before the altar of the Franciscan Friars at Dumfries, in 1306; and his kindred went down, one after another, in the struggle to avenge him.—JOHN COMYN, Earl of Buchan, was defeated by Bruce in a pitched battle near Inverury, in 1308, and his earldom was laid waste. He fled to England, and died in 1313, leaving no children. The possessions of the family, both in Scotland and England, were taken by the King. Consult Douglas, *Peccage of Scotland* (Edinburgh, 1764).

CON. An Italian preposition, meaning 'with,' much used in musical terms, as *con spirito*, *con brío*. The form *col*, a contraction of *con* and *il*, means 'with the.'

CONACHAR, kôn'â-kâr. A character in Scott's novel *The Fair Maid of Perth*, a young Highlander of the clan 'Quhele' (Ray), in love with the Fair Maid, and for a time apprenticed to Simon the Glover. He suddenly becomes chief

of his clan, and is forced, as such, to take part in the historic battle at Perth between his own clan and the clan Chattan. He is by nature a coward, and runs away rather than face Henry the Smith. He kills himself in despair.

CONANICUT. An island of Rhode Island in Narragansett Bay near its mouth. It is about 8 miles long by 1 mile wide and contains the town of Jamestown near the centre, and Conanicut Park in the northern part (Map: Rhode Island, C 4). It has several hundred inhabitants.

CO'NANT, HANNAH O'BRIEN CHAPLIN (1809-65). An American biblical scholar. She was born in Danvers, Mass., and in 1830 was married to Thomas Jefferson Conant (q.v.). In 1838 she became editor of *The Mother's Journal*, and before and afterwards was a contributor to current literature. An erudite Orientalist, she assisted her husband in translations and other literary labors, and produced original works, the chief of which are: *The Earnest Man*, an excellent biography of the missionary Judson (1855), and a *Popular History of English Bible Translation* (1856).

CONANT, THOMAS JEFFERSON (1802-91). An American biblical scholar. He was born at Brandon, Vt., graduated at Middlebury College (Middlebury, Vt.), in 1823, and was professor of Greek, Latin, and German in Waterville College (now Colby University). From 1835 to 1850 he was professor of biblical literature and criticism in the Baptist Theological Seminary at Hamilton, N. Y. He translated (1839) Gesenius's Hebrew Grammar, with the additions of Roediger, a work which became a standard text-book in the United States and England. After holding the professorship of Hebrew and biblical exegesis in the Rochester Theological Seminary from 1851, he settled in Brooklyn, N. Y., in 1857, where he died in 1891, having devoted himself until 1875 to Bible revision for the American Bible Union. He published, in 1864, a treatise on the term *βασιλευς* in the New Testament, which attracted much attention. Dr. Conant was for a number of years one of the American contingent of the Canterbury (England) Committee on the complete revision of the Authorized Version of the Bible. His works further include critical editions, with revised versions of *The Book of Job* (1856); *The Gospel by Matthew* (1860); *The Book of Genesis* (1868); and *The Book of Psalms* (1872).

CONATION (Lat. *conatio*, attempt, from *conari*, to attempt). An endeavor, a striving to attain something. The attempt, e.g. to recall a name which has slipped from memory is a conation. There is a difference of opinion among psychologists as to whether conation is an ultimate aspect of consciousness or a complex of sensation (q.v.) and affection (q.v.).

There are two typical cases of conation—the consciousness accompanying muscular exertion, and the state of active attention. (See ATTENTION.) The similarity of these two experiences has led some psychologists to deny that there is anything more in conation than the strain-sensations following upon muscular contraction plus a pleasantness or unpleasantness. In attention there are, further, the sensations or ideas attended-to and those attended-from. But it is also maintained, on the other hand, that conation

is a simple 'attitude' which mind assumes toward its objects, a peculiar 'mode of being conscious.' It is said to be common to desire, yearning, longing, craving, wishing, and willing; indeed, to all consciousnesses which have an inherent tendency to pass beyond themselves. On this definition conation is a self-determination of consciousness. In desire, e.g. consciousness endeavors to pass from the want of an object to its possession; or, if an unpleasantly toned idea enters consciousness—say the idea of an embarrassing situation—a conation arises, and consciousness makes a forcible effort to eject the unpleasant idea. These two views are not necessarily mutually exclusive, although they arise from two radically different methods of psychology. The first analyzes consciousness without regard to the offices of knowing and willing which mind fulfills—i.e. without reference to the relation of mind to the 'outside' world; the second sets consciousness into relation with its objects, and seeks to discover the 'behavior' of mind toward the world. Or, in other words, the first scrutinizes the 'feeling of effort' or 'endeavor' in an analytic way, and finds only sensations of strain and an affective quality (see AFFECTION); the second assumes that mind takes positive 'attitudes' toward its objects—that it is not only a sequence of occurrences, but a self-determining cause, directing its own contents, an agent in much the same sense that friction is an agent in the production of electricity. Consult: Stout, *Analytic Psychology* (London, 1896); Titchener, *Outline of Psychology* (New York, 1899); James, *Principles of Psychology* (New York, 1890); *Experimental Psychology* (New York, 1901). See DESIRE; EFFORT; FATIGUE; WILL.

CON'ATY, THOMAS JAMES (1847—). An American Roman Catholic prelate. He was born in Ireland, and was educated at Montreal College (1863-67), College of the Holy Cross (1869), and Montreal Theological School (1872). After a pastorate of seventeen years at the Church of the Sacred Heart, in Worcester, Mass., he was, in 1897, appointed by Pope Leo XIII. to the rectorate of the Catholic University, Washington, with the title of domestic prelate to the Pope. In the autumn of 1901 he was raised to the episcopate, with the title of Bishop of Samos *in partibus*, still retaining his position in the university. His publications chiefly comprise biblical text-books for educational institutions.

CON'CAN (Skt. *Konkana*). A territory in the Presidency of Bombay (q.v.), British India (Map: India, B 5). It is a long strip of country, about 300 miles long by 40 miles broad, between the coast of the Arabian Sea and the Western Ghats. Prior to 1818, when it was annexed by the British, it was a Mahratta principality. The modern districts of Thana (population, in 1891, 819,000; in 1901, 809,000) and Ratnagiri (population, in 1891, 1,106,000; in 1901, 1,167,000) are comprised in its area.

CON'CAVE (Lat. *concauus*, hollow, from *com-*, together + *cauus*, hollow; connected with Gk. *κῆρα*, *kyar*, hole, from *κῆν*, *kyein*, to conceive, to contain). A surface is said to be concave when its centre of curvature is toward the observer, convex when its centre of curvature is in the opposite direction to the observer. (See LENS and MIRROR.) In geometry a plane polygon is

said to be concave if any side produced cuts the polygon. A spherical polygon is said to be concave if any side produced cuts the polygon so as to leave part on one hemisphere and part on the other. A solid is said to be concave if any face produced cuts the solid.

CONCEALMENT (from *conceal*, from OF. *concealer*, Lat. *concealere*, to hide, from *com-*, together + *celare*, to hide). As a legal term, the improper suppression or withholding of facts, the covering up of crimes, or the secretion of a person or property. The effect of the concealment of facts is dealt with under such titles as DECEIT; EQUITY; FRAUD; INSURANCE (qq.v.). As an element in criminal offenses, concealment has been considered in the articles on ACCESSORY; BIRTH. **CONCEALMENT OF** (qq.v.). The concealment of goods which are subject to revenue duty, or the secretion of property for the purpose of preventing its being taken in legal process, and the concealment of a debtor to avoid the service of summons on him, are the subjects of statutory provisions, which should be consulted.

CONCENTRATION CAMPS, or DISTRICTS. In the mobilization schemes of countries whose territories are contiguous, an important feature is of necessity the district within which the mobilized forces concentrate. The term concentration camp was used in the Cuban insurrection (1896-98), during which the Spaniards concentrated all Cuban non-combatants within fixed limits; and similarly, in the British-Boer War of 1899-1902, the British collected the women and children of combatants in the field, as well as all non-combatant men, and established them in camps which were popularly known as concentration camps. In 1902 concentration camps were temporarily established by the American military authorities as an incident of the campaign in Mindanao, in the Philippines.

CONCENTRATION MARCHES. The method or means by which several bodies of troops from different directions rendezvous or concentrate at a given point. Before commencing such an operation, it is necessary to arrange and decide upon, first, the base of operations and the objective point; and, secondly, the direction, plan, and method of route. If it is necessary for the various bodies to arrive at a given or uniform time, allowance is made, according to the known or expected proximity of the enemy, and possible or known obstacles or impediments. In calculating necessary time, about 90 yards per minute are allowed for infantry (paragraph 245, *United States Infantry Drill Regulations*), and 100 yards per minute for cavalry and artillery. An average allowance of ten minutes per hour is made for halts. Speed is naturally dependent on the strength and composition of the force making the march, smaller bodies moving quicker than larger ones. A column equal to an army corps of all arms will rarely exceed an average of two miles an hour, and an army division about two and a half. Forced marches are often made in concentrating troops, particularly if a necessary preliminary to a desired engagement.

CONCEPCION, kón-sěp'sě-ōn' (Sp., *concepcion*). The capital of the province of the same name, Chile, situated on the Biobio River, six miles from its mouth (Map: Chile, C 11). The

streets of the city are clean and paved, and are traversed by a street railroad. The chief buildings are the cathedral, the town-hall, the agricultural school, and a normal school. Concepcion is the seat of a bishop. A railroad runs to Talcahuano, on the Bay of Concepcion, the port of the city, where a United States consular agent resides. The city is in a fertile district, and has an active trade, but little manufacturing. Population, in 1899, 55,458. Concepcion was founded in 1550, on the site of the present Penco, and built in its present situation in 1754, after the destruction of the former town in 1751 by an earthquake. During the Spanish occupation it was the second largest city of Chile. Concepcion has suffered severely from earthquakes, the last disastrous one having occurred in 1835, after which the city was rebuilt on a more pretentious plan. In 1818 the independence of Chile was declared here.

CONCEPCION. A seaport town of Panay, Philippines, capital of the District of Concepcion, situated on the eastern coast of the island, 104 miles northeast of Iloilo. It has a post-office and telegraph station. Population, in 1898, 5736.

CONCEPCION. A town of Luzon, Philippines, in the Province of Tarlac, 10 miles south of Tarlac. It has an important sugar industry. Population, in 1898, 13,499.

CONCEPCION DEL URUGUAY, kón-sěp'sě-ōn' del ōō-rōō-gwā'è, or **CONCEPCION.** A town in the Province of Entre Rios, Argentina, situated on the Uruguay River (Map: Argentina, F 10). It is the seat of a national college and a normal school. The town has transportation facilities by rail and water, the river being navigable for large vessels, and controls an important trade in cattle and packed meat. Population, in 1895, 6111. Concepcion del Uruguay was founded in 1778, and was formerly known as Arroyo de la Chma.

CON'CEPT (Lat. *conceptus*, thought, from *concipere*, to conceive, from *com-*, together + *capere*, to seize). A general idea resulting from abstraction (q.v.), and recognized as general. Thus, from particular ideas of this, that, and the other horse, abstraction selects those marks or qualities common to them all, and the resulting idea is the concept horse, provided it is recognized as general. Hegel and many of his followers use the term concept (Ger. *Begriff*) to denote the totality constituted by a thinking consciousness and all its objects. *Notion* was frequently used till within the last few decades as a synonym for concept, and even now it is still current in less technical treatises on logic. See LOGIC.

CONCEPTION. See EMERYOLOGY, HUMAN.

CONCEPTION, in Psychology. See IDEA.

CONCEPTION, IMMACULATE. See IMMACULATE CONCEPTION.

CONCEPTION OF OUR LADY, SISTERS OF THE. An order of nuns, founded in 1484, in honor of the Immaculate Conception, by Beatrix de Silva, sister of James, first Count of Portalegre, in Portugal. It was confirmed in 1489 by Pope Innocent VIII., who granted the sisterhood permission to follow the rule of the Cistercians; but after the death of the foundress, in 1489, Cardinal Ximenes put the nuns under

the direction of the Franciscans, and imposed on them the rule of Saint Clara. The Order subsequently spread into Italy and France. The habit consists of a white gown, a blue mantle, and a scapular on which is worn the image of the Virgin. The Franciscan Sisters of the Immaculate Conception in the United States have their mother house at Little Falls, Minn., where they were established by sisters from Italy in 1891. They conduct three hospitals, and numbered, in 1900, 48 professed sisters and 19 novices.

CONCEPTUALISM. A philosophical theory which is, in some sense, intermediate between realism and nominalism (q.v.), and maintains that, while universals have no real existence in the external world, they do exist as ideas or concepts in the mind, and are thus something more than mere words. This was Abelard's view. See ABSTRACTION; BERKELEY; LOGIC; IDEA.

CONCERTANTE. *Ital. pron. kōn'chēr-tān'lá* (It. p.p. of *concertare*, to perform a concert). An Italian word used to describe an orchestral composition in which two or more instruments or solo voices are in turn given prominent solo parts. See CONCERTO.

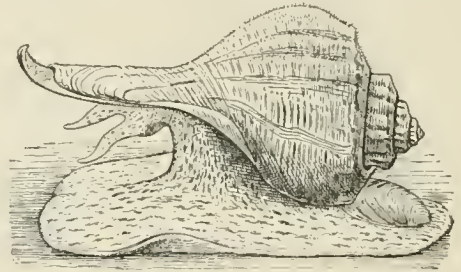
CONCERTINA, *kōn'sēr-tē'ná* (from It. *concerto*, concert). An hexagonally shaped musical instrument, the sounds of which are produced by free, vibrating tongues of metal, as in the accordion. The scale of the concertina is very complete and extensive, beginning with the lowest note of the violin. G. and ascending chromatically for three and a half octaves to C. There are two tongues for every tone, so that any note can be produced either by pulling the bellows open, or by pressing them together. Wheatstone, of London, invented the concertina in 1829. The instrument is capable of a great range of expression, and concertina playing by skilled performers comes rightly under the head of artistic music.

CONCERTO (Fr. *concert*, from It. *concerto*, concert, from It., Lat. *concertare*, to vie, from *com-*, together + *certare*, to contend; less probably from *conserere*, to join together, from *com-*, together + *serere*, to join). A musical composition for a solo instrument, with orchestral accompaniment, calculated to exploit the resources or possibilities of the instrument and thus to give the performer an opportunity to display the highest technical skill (see CADENZA), as well as intellectual grasp and musical culture. The concerto belongs to the cyclical or sonata (q.v.) group of musical compositions, and differs from a symphony or overture only through the special prominence given to the solo instrument. It consists, like the symphony or sonata, of three or four movements, each of which, like the whole, requires a clear development and treatment of motives, and a strict adherence to the rules of form. The earliest concertos were written for two or more instruments, being thus really in concertante (q.v.) style. From the beginning of the eighteenth century the pianoforte and the violin have been the solo instruments mostly used for the concerto. Among the oldest violin concertos are those by Tartini and his pupils. The French and Germans afterwards improved on these and fixed the forms, which all the great masters of modern times have adhered to.

CONCERT PITCH. See PITCH.

CONCH, *kōŋk* (Lat. *concha*, Gk. *κόγχη*, *kōnchē*, Skt. *śankha*, shell). The name of many

large univalve mollusks. Originally and properly it belongs to the big carnivorous strombs, and especially to the great rose-lined stromb (*Strombus gigas*) of the West Indies and Florida Reefs, more particularly designated 'queen-conch.' Shiploads of these shells are sent to Europe and the United States every year to be ground up for porcelain, burned into lime, calcined for medicinal purposes, or used as ornaments; many are perforated at the apex and



A CONCH (*Sycotypus canaliculatus*).

The attitude is that of creeping toward the left. Beneath the protruding siphon-tube, two tentacles show the place of the head, the lower one showing the black dot of the eye. On the rear of the expanded foot is the operculum.

serve as dinner-horns on Southern plantations. Cameos of an inferior sort are cut in it; and from it are derived, especially in the Bahamas, pink 'conch-pearls' of value. It is because many of them made an occasional industry of gathering these mollusks, and searching for pearls, that the poorer sort of people of southern Florida and neighboring islands are called 'Conchs.' The Indians used the columella of this shell as material for fine beads; and their remains, as well as those of many other large mollusks, abound in the coastal shell-heaps. In the East Indies the term is applied often to other large spiral shells, especially those of the closely allied family Tritonidae. These are often perforated and fitted with mouthpiece and finger-holes, and so turned into sonorous musical instruments. This is the shell adopted by artists in representations of sea-myths—

"Have sight of Proteus rising from the sea,
Or hear old Triton blow his wreath'd horn."

In the Northern States, 'conch' means either of two large, pear-shaped univalves of the Atlantic Coast, *Fulgur carica* and *Sycotypus canaliculatus*, which frequent the sandy bottoms near shore and are cast up on beaches in great numbers. Both are carnivorous and do great damage to oyster-beds. The former, which has a spiral row of short horns defining the whorls, is more common southward, while the latter, distinguished by the squarish channels between the whorls, is nearly confined to the region between Cape Cod and New Jersey. Both are abundant about Long Island and on the southern New England coast, where they are confused under the name 'periwinkle' or 'winkle.' The 'sea-necklaces,' consisting of parchment-like hollow disks apparently strung upon a long cord, which attract attention on beaches in mid-summer, are the egg-cases of these mollusks, which have been torn from their attachment to some rock or seaweed and floated ashore. It was from the column of these shells that the Indians made their white wampum. (See WAMPUM.) Consult Ingersoll,

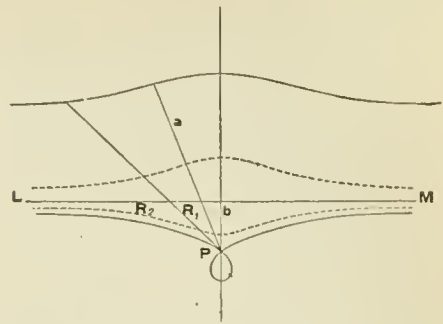
"Natural History of Economic Mollusks of the United States." *United States Fish Commission Bulletin for 1889.*

CON'CHA, JOSÉ GUTIERREZ DE LA, MARQUES DE LA HABANA (1809-95). A Spanish soldier and statesman, born at Córdoba, Argentina. Shortly after the death of his father he went abroad and entered the Spanish Army, in which he was rapidly promoted. He was Captain-General of the Basque Provinces (1843-46), and three times Captain-General of Cuba (1849-52, 1854-59, and 1874-75), in which latter capacity he was charged with complicity in the slave-trade. He was made Senator in 1860, and successively held the positions of Minister to France (1862), Minister of War (1863), and president of the Senate (1864-68). During the absence of Queen Isabella in France, he was appointed by her the successor of Gonzales Bravo as president of the Council, September, 1868, but was immediately forced to resign, by the outbreak of the revolution which ended in the fall of the monarchy.

CONCHA, MANUEL GUTIERREZ DE LA, MARQUES DEL DUERO (1808-74). A Spanish general, brother of the preceding, who served against Don Carlos. He was promoted to the rank of field-marshal in 1840, and in 1841 joined in the revolt against the regency of Espartero. As Captain-General of Catalonia, in 1845, he suppressed, within a fortnight, an uprising of that province against conscription. Two years later, in command of the army sent to Portugal, he skillfully adjusted the dispute between the two countries without bloodshed, and was created Marques del Duero. With O'Donnell and others he petitioned Queen Isabella in 1853 for a liberal government and the immediate convocation of the Cortes. He was thereupon banished to the Canary Islands, and fled from there to France, but on the downfall of Narvaez, in the following year, returned to Spain and was reinstated in all his dignities. In the Revolution of 1868 he supported Isabella, and was placed in command of the troops in Madrid. The cause of the Bourbons, however, seeming hopeless, he contented himself with preserving order until the arrival of the victorious Revolutionary army under Serrano, to whom he relinquished the command. He then lived abroad until appointed commander of the Northern Army in the last Carlist war, when he contributed materially to the relief of Bilbao. On June 28, 1874, he was killed at the head of his troops in the assault on the Carlist stronghold of Estella.

CONCHOID (kōn'koid) (Gk. κογχοειδής, *konchoidēs*, mussel-shaped, from κογχή, *konchē*, shell + εἶδος, *eidos*, form) **OF NICOMEDES**. A 'shell-shaped' curve invented by Nicomedes (B.C. 180). It is related to the problems of trisecting an angle (see **TRISECTION PROBLEM**), of constructing two geometric means between two given straight lines, and of duplicating the cube. The curve may be constructed by drawing a straight line LM for the directrix, and through any point P as the pole drawing a pencil of lines cutting LM in R_1, R_2, \dots . The conchoid is the locus of points found by laying off a constant length each way from R_1, R_2, \dots on these rays. This constant length is called the modulus. The curve differs in general shape according as the modulus is equal to, greater than, or less than

the distance of the fixed point from the fixed straight line. The figure shows the forms of the curve in the last two cases. The loop occurs when the modulus is greater than the perpendicu-



lar distance of P and LM. When the modulus equals this distance, P is a cusp on the curve. The directrix LM is an asymptote to the two branches of the curve. If the foot of the perpendicular from the pole to the directrix be taken as the origin, and the distance be called b , and the modulus a , the equation of the conchoid is $(y + b)^2(a^2 - y^2) - x^2y^2 = 0$. Its order is the fourth, and its class the sixth unless P is a cusp, in which case its class is the fifth. (See **CURVES**.) P is, in general, a double point, and the curve meets its asymptote at four consecutive points at infinity. The curve may easily be described mechanically, and is frequently used in architecture as a bounding line of the vertical section of columns. Consult: Sundara Row, *Geometric Paper Folding* (Chicago, 1901); Klein, *Vorträge über ausgewählte Fragen der Elementargeometrie* (Leipzig, 1895), translated as *Famous Problems of Geometry* (Boston, 1897).

CONCHOLOGY, kōn-kōl'ō-jī. See **MOLLUSCA**.

CONCHOS, kōn'chōs, Rio (connected with Sp., Lat. *concha*, shell). A river in Mexico, in the State of Chihuahua, rising on the southern border of the east of the Sierra Madre, flowing in a northerly direction through the rice tableland of that region, and joining the Rio Grande del Norte at Presidio del Norte after a course of about 350 miles (Map: Mexico, G 3). It receives a number of confluent from the west, but no important tributary from the east.

CONCIERGE, kōn'syärzh' (Fr., doorkeeper). The French title of the janitor of an apartment-house. He is an important functionary in the life of most French and German cities; he sits in his little office by the main entrance and exercises a certain supervision over all those who pass in or out, opening the door to those who enter after a certain hour of the night (in Vienna as early as 10 o'clock).

CONCIERGERIE, kōn'syär'zh'ré'. LA. A Paris prison, famous as the place of confinement of political prisoners during the French Revolution. It forms a part of the Palais de Justice toward the river, and was originally the residence of the concierge of the old palace. Among the famous prisoners confined in the Conciergerie and taken thence to the guillotine were Malsherbès, Madame Roland, Danton, Desmoulins, and Robespierre. Here Marie Antoinette was confined before her execution, in a small cell, afterwards changed into a chapel. In 1840

Napoleon III. was for a time an inmate of the prison, which is now used only for the temporary detention of prisoners.

CONCLAVE (Fr., Sp., Port., It., Lat., room which may be locked, from *con-*, together + *clavis*, key, Gk. *κλεις*, *kleis*, key, from *κλειν*, *klein*, to shut). Either the place where the cardinals assemble for the choice of a pope, or the assembly itself. In 1179 a Lateran Council decreed in its first canon that a two-thirds vote of the cardinals was essential for a choice. This decree was developed, and the regulations which are, substantially, still in force established by Gregory X. at the Council of Lyons in 1274. These rules are intended to provide against unnecessary delay or precipitation in election, and against any external interference with absolute freedom of choice. The large hall is divided into a number of small apartments, two rooms being allotted to an ordinary cardinal and three to one of princely rank. People are allowed to enter freely during the first day, at the end of which all entrances are absolutely closed except one, which remains under the strict supervision of officials designated for the purpose. Food and other necessaries are handed through a window, and are subjected to a rigorous examination, in order to prevent communication with the outer world, the cardinals not being allowed to leave the place, or to receive or send out letters, until a new pope is chosen. Consult: Zöpffel, *Die Papstwahlen* (Göttingen, 1871); for a more popular treatment, Trollope, *The Papal Conclaves, as They Were and as They Are* (London, 1876). A full and graphic description of a typical conclave, that which elected Alexander VII., will be found in Shorthouse, *John Ingle-sant* (London, 1881). See POPE.

CONCOMITANCE (ML. *concomitancia*, from Lat. *concomitari*, to accompany, from *com-*, together + *comitari*, to accompany, from *comes*, companion). **SACRAMENTAL**. In the Roman Catholic Church, a term which implies that the body and blood of Christ, sacramentally, accompany each other, so that under either form, whether wine or bread, both are sacramentally received. Hence the laity in that communion, although they are not permitted to take the cup, still are held to receive Christ's body and blood.

CONCOMITANT VARIATION, METHOD OF. See INDUCTION.

CONCONE, kōn-kō'nā, GIUSEPPE (1810-61). An Italian vocal teacher, born in Turin. He is widely known for his vocal exercises—*solfeggi* and *vocalizzi*—which are unusually attractive for works of their kind, and at the same time excellent for their special purpose. For about ten years Concone resided in Paris as a teacher. Returning to Turin in 1848, he was at the time of his death organist and choir-master of the Court choir.

CONCORD, kōn'kōrd. A town in Middlesex County, Mass., 20 miles northwest of Boston; on the Concord River and on the Boston and Maine Railroad (Map: Massachusetts, E 3). It has manufactures of rubber goods and harness. The Massachusetts Reformatory is situated here. The government is administered by town meetings, held annually and at special call. Population, in 1890, 4427; in 1900, 5652.

Concord, settled in 1635, is the oldest interior

town in Massachusetts, and by the time of the Revolution had come to be "one of the great centres, not only of intellectual life, but also of political influence and power." In August, 1774, the Middlesex Convention, the first county convention assembled in Massachusetts, was held here, every town being represented; and on October 11, under the stimulus of the Revolutionary agitation, the first Provincial Congress, presided over by John Hancock, met to consider the ways and means of resisting the tyrannies of the mother country. Later large quantities of ammunition and military supplies were stored here, and in an attempt made by the British to destroy them, on April 19, 1775, occurred the memorable fight which precipitated the War of the Revolution. (See LEXINGTON.) In 1787, during Shays's Rebellion, a body of insurgents entered Concord and prevented the sitting of its courts. The town is chiefly notable for having been the home of a distinguished coterie of writers and thinkers, including Emerson, Thoreau, A. Bronson Alcott, Louisa M. Alcott, Hawthorne, and William Ellery Channing, 'the poet.' Consult: Hurd, *History of Middlesex County* (Philadelphia, 1890); Emerson, *Historical Discourse Delivered in 1835* (Concord, 1835).

CONCORD. A city, capital of New Hampshire, and county-seat of Merrimack County, 75 miles north-northwest of Boston; on the Merrimack River and on the Boston and Maine Railroad (Map: New Hampshire, J 9). It has wide streets, shaded and well paved, and a good water-supply, owned and operated by the municipality. Among the principal buildings are the State House, built of granite, United States Government building, court-house, and city hall, State prison, State insane asylum, the Margaret Pillsbury Hospital, State Library, and Saint Paul's School (Episcopal) for boys. There are several parks: White's, Rollins, Fiske, Cottoocook River, and Pennacook. In the State-house park is a bronze statue of Daniel Webster, and at Pennacook, a monument to Hannah Dustin. In the vicinity are extensive quarries of fine-grained white granite, the quarrying of which is one of the leading industries. The repair-shops of the Boston and Maine Railroad are situated here. The manufactures include carriages, silverware, harness, furniture, flour, cotton and woolen goods, leather belting and leather hose, pianos, shoes, etc. Industrial statistics for 1900 give the following figures: Number of industries, 81; invested capital, \$1,959,238; value of production, \$3,252,302; persons employed, 1829. Under the charter of 1853, as amended, Concord is governed by a mayor, chosen every two years, and a bicameral city council. The assessors and the school board are chosen by popular election; other appointments are controlled by the Mayor and Board of Aldermen, and the Council. Population, in 1890, 17,004; in 1900, 19,632.

Concord was founded in 1725, on the site of Pennacook, the chief village of the Pennacook Indians, and bore that name until 1733, when it was incorporated as Rumford. It suffered greatly in all the Indian wars and was the scene of a massacre in 1746. In 1765 Rumford was renamed 'Concord.' On the adoption of a State constitution it became the capital of New Hampshire, and in 1853 was incorporated as a city. Consult: Moore, *Annals of Concord, N. H.* (Con-

cord, 1824); and Bouton, *The History of Concord* (Concord, 1856).

CONCORD. A city and county-seat of Cabarrus County, N. C., 21 miles northeast of Charlotte; on the Southern Railroad (Map: North Carolina, B 2). It has foundries and machine-shops, and extensive manufactures of cotton. First incorporated in 1793, Concord is governed at present under a charter of 1851, revised in 1891, which provides for a mayor, elected biennially, and a city council. Population, in 1890, 4339; in 1900, 7910.

CONCORD, IN MUSIC. See CONSONANCE.

CONCORD, BOOK OF (translation of Ger. *Concordienbuch*, Lat. *Liber Concordiarum*). A collection of confessions of faith published in 1580, generally accepted by the Lutheran Church. Its contents are: (A) The three ecumenical creeds—the Apostles, the Nicene, and the Athanasian. (B) The six particular confessions of the Lutheran Church—(1) the Augsburg Confession; (2) the Apology of the Augsburg Confession; (3) the Schmalkald Articles; (4 and 5) the Larger and Smaller Catechisms of Luther; (6) the Formula of Concord. The last-named division, the Formula of Concord, appeared in 1580, after protracted conferences, and was acceded to by 86 of the States of the German Empire. Its topics are: The Rule of Faith and the Creed; Original Sin; Free Will; Justification; Good Works; The Law and the Gospel; The Third Use of the Law; The Lord's Supper; The Person of Christ; The Descent of Christ into Hell; The Customs of the Church; Predestination and Election; and an appendix concerning heresies and sectaries. The best editions are: In German, Jubilee edition (Saint Louis, 1880); in Latin, that of S. F. Francke (Leipzig, 1847); in English, that of H. E. Jacobs (Philadelphia, 1882).

CONCORD, TEMPLE OF (so called). A Doric temple at Girgenti, the ancient Agrigentum, in Sicily, and one of the most perfectly preserved of ancient temples. Its 34 columns are still standing.

CONCORDANCE (ML. *concordantia*, agreement, from Lat. *concordare*, to agree, from *com-*, together + *cor*, heart). A book arranged in alphabetical order, and showing in what passages all, or at least all of the more important, words in any work occur. For writings of universal import from which passages are continually being adduced to prove or support principles affecting our daily life and action, such a handbook is indispensable. The necessity for such a book upon the Bible was doubtless early felt, but the first Bible concordance was made by the famous Saint Anthony of Padua (q.v.), who in the early part of the thirteenth century published it under the title *Concordantia Morales in Sacra Biblia* (best edition, de la Haye, Paris, 1641). His example was followed by Cardinal Hugo de Saint Cher in 1244 with his *Concordantie Jacobi*, so called because made in the Convent of Saint James in Paris. Both these works were of course based on the Vulgate, as were several similar ones before the invention of printing. The earliest printed concordance to the Vulgate is by Joannes de Segovia and Sebastian Brant (Basel, 1496), and it is the basis of that published and edited by Robert Stephens (Paris, 1555). A concordance to the Greek Bible (Old and New Testament) was made by Euthalius of Rhodes

about 1300; it has never been printed, but a manuscript copy was seen in Rome in the seventeenth century. One to the Septuagint was compiled by Conrad Kircher (Frankfort, 1607); and to the Greek New Testament by Nystus Betuleius (Basel, 1546), which, as amended by Robert Stephens and his son Henry, was published by the latter (Paris, 1594). Rabbi Isaac Nathan finished in 1448 a concordance to the Hebrew Bible (Venice, 1524), which in amended form by Marius de Calaris was published (Rome, 1621-22); another was begun by the elder and finished by the younger Johann Buxtorf (Basel, 1632). The first work of this kind in English was a concordance to the New Testament printed and in all probability prepared by Thomas Gibson (London, 1535); but the first concordance to the entire English Bible was by John Marbeck (London, 1550). Luther's German Bible had to wait till 1610 before a concordance to it appeared at Frankfort. The author was Conrad Agricola.

But all these works are now superseded by the vastly better modern works. For the Hebrew Bible the standard concordance is that by Julius Fürst and Franz Delitzsch, in Latin (Leipzig, 1837-41); but just as good for all practical purposes will be found *The Englishman's Concordance to the Hebrew Old Testament* (London, 1843; 4th ed., 1873), compiled by Tregelles, B. Davidson, and others. For the Septuagint, the best is by Edward Hatch (London, 1892); for the Vulgate, the latest is by V. Coornaert (Bruges, 1892). To the Greek New Testament the best concordance in Latin is by C. H. Bruder (Leipzig, 1842; 5th ed., Göttingen, 1900); in English by W. F. Moulton and A. S. Geden (London and New York, 1897). To Luther's Bible the standard is M. G. Büchler's (Jena, 1740; 23d ed., Berlin, 1899). To the Authorized Version of the English Bible, Alexander Cruden was the first to prepare a concordance which met with wide acceptance (London, 1737), and it has been reprinted so often, complete or in condensation, that Cruden has become a household word. Two others, however, compete for the palm of superiority—Robert Young, *Analytical Concordance to the Bible* (Edinburgh, 1879), often reprinted, and James Strong, *The Exhaustive Concordance* (New York, 1894), which takes account of every word and is surely the most ambitious work of its kind.

Other books than the Bible have been furnished with concordances by the patient and long-continued labors of scholars. To enumerate a few: *Dante*, E. A. Fay (Boston, 1889); *Chaucer*, the Chaucer Society (begun London, 1872); *Shakespeare*, Mrs. Mary Cowden Clarke (London, 1845); or better, John Bartlett (New York, 1894); Milton, *Poetical Works*, G. L. Prendergast (Madras, 1857); C. D. Cleveland (London, 1867); *Pope*, E. Abbott (ib., 1875); *Cowper*, *Poetical Works*, J. Neve (ib., 1887); *Shelley*, F. S. Ellis (ib., 1892); *Dickens*, G. A. Pierce (ib., 1898); *Tennyson*, D. R. Brightwell (ib., 1869).

CONCORDAT (Fr., agreement). A term used to designate a compact dealing with ecclesiastical affairs between the Pope, as head of the Roman Catholic Church, and the temporal ruler of a State. Concordats commonly relate to things which are neither purely spiritual nor purely temporal, but mixed matters, in regard to which the action of the two powers can with

difficulty be dissociated. Concordats may be framed either in the form of a treaty, to which both the contracting powers are consenting parties, or enacted by proclamation issued only by one party, most commonly by the Pope, embodying in the form of a decree the regulations resulting from the terms of agreement previously arrived at. The difference is only in form. It is a settled doctrine of Roman Catholic canonists, and especially of those of the Ultramontane (q.v.) school, that the Pope never absolutely cedes purely spiritual powers. Thus, in the presentation to bishoprics, while the King 'nominated' or 'elected,' the Pope always reserved to himself the power of 'canonical institution.' There have been many famous concordats, of which the following are the most important: (1) *Concordats with Germany*.—The well-known Concordat of Worms in 1122, respecting investitures, is commonly regarded as the first concordat strictly so called. Similar agreements took place on the question of the *Regalia* (q.v.), between the Roman See and the emperors Otho IV., Frederick II., and Rudolph of Hapsburg. A more comprehensive compact on Church matters is that of which the foundation was laid at Constance in 1418, and which was subsequently modified by the 'Frankfort' or 'Princes' Concordat,' by the Concordat of Aschaffenburg, and by that of Vienna, which last, although practically disregarded by Joseph II. and his successor, Leopold II., continued in use till the dissolution of the Holy Roman Empire in 1806. Its place was supplied, under Pius VII. and his immediate successors, by separate concordats with Bavaria, 1817; Prussia, 1821; Baden, Württemberg, and other minor States, 1818; Hanover, 1824; and Saxony, 1827. The last German concordat was that concluded at Vienna, August 18, 1855. This provided for the fullest Papal authority in the Austrian dominions. The Church was to control education and to exercise a censorship over the press. The ecclesiastical courts were accorded special privileges. The Emperor was to nominate bishops, but only with the advice of the existing bishops and archbishops. The Church might acquire new property, but once acquired, it could not be sold or mortgaged without the consent of both Pope and Emperor. This concordat, so favorable to the Papacy, was set aside in 1868 in all the dominions of the Emperor of Austria. (2) *With France*.—The Pragmatic Sanction, ascribed to Saint Louis, but really of later date, has some of the characteristics of a concordat; but the first proper concordat is that of Bologna, concluded by Francis I. with Leo X. in 1515 and 1516, which continued in force, although with more than one conflict of the two powers, till the Revolution. In reëstablishing the Church in France, Napoleon Bonaparte, as First Consul, concluded with Pius VII. the celebrated Concordat of 1801, which he afterwards compelled the Pope, then a captive at Fontainebleau, to modify by a new act in 1814. Both were ignored at the Restoration; but an attempt to produce a substitute in 1817, and again in 1819, led to no result. (3) *With Italy*.—In Italy, an agreement regulating the election of bishops was concluded with Nice and Savoy by Nicholas V. in 1415; and a formal concordat was made with Sardinia by Benedict XIV. in 1740. The ecclesiastical affairs of Naples were anciently regulated by the terms of what

was called the *Monarchia Sicula*; but a formal concordat was made by Pius VII. in 1818. (4) *With Spain*.—Charles I. concluded a concordat for his Spanish kingdom with Adrian VI. and Clement VII.; and a further concordat was made by Clement XII. and Philip V. in 1737. (5) *With Portugal*.—Benedict XIV. made a concordat with Portugal in 1741. Besides these, the Papacy has from time to time made many similar concordats with various small powers, especially with South American States in the nineteenth century. The age of concordats has passed away with the establishment of the preponderance of the State over the Church, and no great power to-day would bind itself as Austria did in 1855.

Consult: Phillimore, *Commentaries on International Law* (London, 1889); Séché, *Les origines du Concordat* (Paris, 1894). The texts of the various concordats will be found in the collections of Münch (Leipzig, 1830); Nussi (Mainz, 1870); Walter (Bonn, 1862); Balve (Munich, 1863); often with extensive commentaries. See AUSTRIA-HUNGARY; CONSTANCE, COUNCIL OF; GERMANY; HOLY ROMAN EMPIRE; INVESTITURE; NAPOLEON I.; PIUS VII.

CONCORDE, kôn'kôrd', PLACE DE LA (Fr., Square of Concord). The largest square in Paris, the starting point of the Champs Elysées, bounded by the Rue de Rivoli, the Tuileries Gardens, and the Seine. It is associated with many historical occurrences. On it, on May 30, 1770, occurred a panic caused by fireworks, resulting in the death or injury of over 3000 persons. On the spot now occupied by the obelisk stood the guillotine by which more than 2800 persons died between January 21, 1793, and May 3, 1795. In 1871 the Versailles troops engaged in a fierce struggle with the Communists on the square. The present name of the place, previously the Place Louis XV., was given in 1799. It was again called Place Louis XV. from 1824 to 1830, when the name now in use was restored. Architecturally the square is one of the finest in the world. It is adorned with an obelisk from Luxor, presented by Mehemet Ali in 1831, with striking fountains, and eight figures representing the principal towns of France, and at night is brilliantly illuminated by twenty large bronze clusters of lamps. It commands a fine view of the Champs Elysées with the Arc de Triomphe, of the Madeleine, and of the Chambre des Députés, approached by the Pont de la Concorde.

CONCORDIA, kôn-kôrd'ê-â. A river port in the Province of Entre Rios, Argentina, situated on the right bank of the Uruguay (Map: Argentina, F 10). It has oil-mills and slaughter-houses, and exports large quantities of salt meat, leather, and Paraguay tea. Population, in 1895, 14,804.

CONCORDIA, kôn-kôrd'ê-â. A city and the county-seat of Cloud County, Kan., 210 miles west by north of Kansas City, on the Republican River, and on the Missouri Pacific, the Union Pacific, and other railroads (Map: Kansas, E 2). Good transportation facilities, abundant water-power, a fertile agricultural country, and valuable deposits of coal and building-stone have aided in developing the city's commercial and industrial interests. There are grain elevators, flouring-mills, iron-works, plow and wagon

works, etc. The city contains Nazareth Academy, Saint Aloysius's School, and library association and high school libraries. Population, in 1890, 3184; in 1900, 3401.

CONCORDIA (Lat., from *con-*, together + *cor*, heart). A Roman divinity, the goddess of harmony. Many temples were built in her honor, the oldest of them by Camillus in B.C. 367, after the passing of the Licinian Laws. It stood on the Forum between the Temple of Saturn and the Mamertine Prison, and was built of white marble with a richly carved cornice. The interior was flanked with rows of columns against the walls, with niches which held masterpieces of Greek sculpture. It contained, besides, paintings and a collection of precious stones. It was twice rebuilt, in B.C. 121 and under Augustus, but only scanty ruins now remain. The temple sometimes served as a meeting-place for the Senate, and Cicero there delivered his last oration against Catiline. The goddess was represented as a matron, holding in her right hand a saucer-like vessel (*patera*), or an olive branch, and in her left the horn of plenty. Her symbols were two hands clasped together, and two serpents entwined about a wand.

CONCRESCENCE (Lat. *concresecientia*, growing together, from *concresecere*, to grow together, from *com-*, together + *cresecere*, to grow; connected with Lat. *creare*, to create). The growing together of young plant organs by reason of mutual contact or pressure when forming. The term has also been applied to the apparent union of neighboring organs, such as the flower parts. In these cases, however, each organ begins its development independently, and those which appear to be united are lifted by the growth, underneath the separate rudiments, of a region of tissue which belongs equally to all. See TERATOLOGY; FLOWER.

CONCRETE (from Lat. *concretus*, p.p. of *concresecere*, to grow together). Opposed to abstract. See ABSTRACTION.

CONCRETE. An artificial stone composed of hydraulic cement (q.v.), sand, and broken stone or gravel, or other hard material in small fragments. The mixture of sand and cement is commonly called the matrix, and the broken stone or other material is similarly called the aggregate. The matrix may be either lime and sand or cement and sand mortar, but is more usually the latter. The aggregate may be pebbles, gravel, broken stone, broken bricks, shells, slag, coke, etc., but the most commonly used aggregates are broken stone and gravel. Broken stone gives a stronger concrete than gravel, other things being equal. The proper proportions of the several constituents composing concrete is considered to be attained when the cement paste exactly fills the voids in the sand, and the matrix exactly fills the voids in the aggregate; less than enough mortar to fill the voids in the aggregate results in a weaker and more porous concrete, and more than enough adds to the cost of the concrete without increasing its strength.

It is evident from this statement that the relative proportions will vary with the character of the sand and aggregate employed. A fair range of proportions for most engineering works is cement, one part; sand, one to three parts; aggregate, four to six parts. There is

considerable diversity of opinion as to the amount of water to be used in making concrete. According to one extreme view, the amount of water should be such that the concrete will quake when tamped; according to the other extreme, the mixture should be made so dry that water will barely flush to the surface when the concrete is tamped. Current practice varies all the way between these two extremes. The manufacture of concrete consists simply in mixing the water, cement, sand, and aggregate of which it is composed. To obtain the best results this mixture should be exceedingly thorough; the ideal mixture is attained when every grain of sand is covered with a film of cement paste and every fragment of aggregate is covered with a coating of mortar. Both hand mixing and machine mixing are employed in practice. In hand mixing the proper proportions of cement and sand are deposited on a timber platform and mixed dry by repeated turnings with a shovel. The proper quantity of water is then added, preferably with a spray, and the mixture then turned and returned with shovels until the water is thoroughly and evenly incorporated with the cement and sand. The aggregate is then thoroughly wetted and is mixed with the mortar by similarly repeated turnings with shovels.

A variety of concrete-mixing machines are employed, some being intermittent and some being continuous in operation, the latter sometimes automatically measuring the proportions of cement, sand, aggregate, and water. Perhaps the most common form of intermittent mixer is a cubical iron box hung on trunnions at diagonally opposite corners; the cement, sand, and aggregate in the proper proportions are placed in the box through a suitable door in one side which can be closed and fastened; the water is admitted through the hollow trunnions, and the box is put in revolution by an engine or other motive power. After from ten to twenty turns the box is brought to rest, its contents of thoroughly mixed concrete dumped out into barrows or cars and a new charge of cement, sand, and aggregate introduced for mixing. A common form of continuous concrete-mixer consists of a trough or cylinder in which a spiral or bladed screw shaft revolves; the raw materials are introduced continuously at one end, and a continuous discharge of mixed concrete takes place at the opposite end. There are numerous other forms of concrete-mixing machines.

The value of concrete as a structural material consists in its property of changing from a plastic condition into a hard, rigid, artificial stone by the setting and hardening of the cement paste. (See CEMENT.) Concrete composed of one part cement, two parts sand, and six parts broken stone has a compressive strength of from ten to twenty tons per square foot at the age of one year. The method of laying the concrete after mixing depends upon the position in which it is placed and upon the form in which it is to be used in the structure. When used in the form of blocks, the blocks are made by placing the plastic mixture in suitable molds in thin layers and tamping each layer thoroughly with wooden or iron rammers before placing the succeeding layers. The mixture remains in the molds until it is hard, when the block is removed and laid in the structure just as a corresponding block of stone would be laid. The more common method of using con-

crete is to place it in the structure in its plastic condition, and let it harden in place. When the work is in the air the mixture is laid and rammed in layers, just as is done in making concrete blocks, but when it is laid under water it has to be deposited in buckets, which open when the bottom is reached and discharge their contents, or it is run through circular chutes, which reach from the surface to the bottom. Sometimes concrete is placed under water by inclosing it in paper bags, which are slid down a chute; the bags become wet and the concrete bursts them open, thus allowing the succeeding bagfuls to unite into a solid mass. Sometimes, also, coarse open-cloth bags are used, the cement oozing through the meshes sufficiently to unite the whole into a single mass. The chief care to be exercised in placing concrete under water is to prevent the cement, sand, and aggregate from becoming separated. Concrete weighs when hard from 130 to 160 pounds per cubic foot, and costs, laid, from \$2 to \$10 per cubic yard.

The uses of concrete are excellently summarized in *A Treatise on Masonry Construction*, by Prof. I. O. Baker, as follows: "Concrete is admirably adapted to a variety of most important uses. For foundations in damp and yielding soils, and for subterranean and submarine masonry, under almost every combination of circumstances likely to be met with in practice, it is superior to brick masonry in strength, hardness, and durability; it is more economical; and in some cases is a safe substitute for the best natural stone, while it is almost always preferable to the poorer varieties. For submarine masonry, concrete possesses the advantage that it can be laid, under certain precautions, without exhausting the water, and without the use of a diving-bell or submarine armor. On account of its continuity and impermeability to water, it is an excellent material to form a substratum in soils infested with springs; for sewers and conduits; for basement and sustaining walls; for columns, piers, and abutments; for the pointing and backing of walls faced with brick, rubble, or ashlar work; for pavements in areas, basements, sidewalks, and cellars; for the walls and floors of cisterns, vaults, etc. Groined and vaulted arches, and even entire bridges (see BRIDGES), dwelling-houses, and factories in single monolithic masses, with suitable ornamentation, have been constructed of this material alone." Consult Baker, *Treatise on Masonry Construction* (New York, 1900). See MORTAR.

CONCRETE TERM. In logic, any name, whether substantive or adjectival, which denotes a thing and connotes a quality. See CONNOTATION; DENOTATION.

CONCRETION (Lat. *concretio*, coalescence, from *concresecere*, to grow together). A term used in medicine to denote a formation of solid, unorganized masses within the body, either by chemical precipitation from the secretions, or by the accidental aggregation of solids introduced into the system from without. If composed of precipitates in the urinary bladder, gall-bladder, or salivary ducts, concretions are called calculi. (See CALCULUS.) They may also be found in former cavities in the lungs, as well as in tubercular joints, in which cases they are composed of lime salts. They may be found in the fingers and toes of gouty patients, appearing in nodules projecting from the sides of the joints, and termed

'crabs' eyes.' These nodules are frequently composed of urate of sodium. Concretions composed of fecal matter are frequently found in the vermiform appendix, in cases of appendicitis; very rarely a fruit-seed is the basis and centre of such a concretion. Concretions have been formed upon pieces of catheter in the urinary bladder, and upon beans in the nostrils. Concretions formed of balls of hair, concretions of Epsom salts swallowed undissolved, and concretions of cholesterolin (q.v.) have been found in the intestines. See BEZOAR.

CONCRETIONARY STRUCTURE. A condition produced in rocks by molecular aggregation about some nucleus, whereby the rock masses assume regularity of outline. This structure is exhibited in both igneous and sedimentary rocks, and may be due to processes acting at the time of their formation (primary concretions), or subsequent to their formation (secondary concretions). It is especially frequent in limestones, clays, and iron ores. Oolite is a limestone composed of rounded grains which resembles fish-roe in appearance and not infrequently attains great thickness. The flints of the English chalk formation are an example of siliceous concretions. Clay-ironstone, hematite, limonite, pyrite, and marcasite often assume nodular or oolitic form, and are widely distributed in geological formations. The structure of these primary concretions is due to the tendency which atoms and molecules possess, when in a state of solution or suspension, of attaching themselves to some foreign body. Particles of silica, such as sand and frustules of diatoms, commonly serve as central points of attachment. Secondary concretions are developed by weathering in sandstones, shales, and limestones; the decomposition and disintegration take effect first on the surface of the rock masses, progressing thence toward the interior. Concretionary structure is rarely developed in igneous rocks, the best example being the beautiful diorite (Napoleonite) of Corsica, in which the feldspar, quartz, and hornblende constituents have grouped themselves into globular aggregations.

CONCUBINAGE (from OE., Fr. *concubine*, from Lat. *concubina*, concubine, from *concumbere*, to lie with, from *com-*, together + *cubare*, to lie). In general, the cohabitation as husband and wife of a man and woman who are not lawfully married to each other. Specifically, a form of polygamy in which the primary matrimonial relation is supplemented by one or more secondary and inferior relations of the same kind. It was used, technically, in the former sense, in the common-law action for dower, in the allegation that the woman claiming dower was not a wife lawfully married to the party in whose land she seeks to be endowed, but his concubine. In the United States, the term has been applied, under the Edmunds acts of 1882 and 1887, to the polygamous relations of the Mormons, at which the acts were aimed. In its general sense, as denoting merely unlawful cohabitation, concubinage, however abhorrent to the moral sense of the community, is not in most jurisdictions obnoxious to the criminal law. (See CRIM. COX.) In its special sense, however, as signifying a plurality of wives, it comes under the penalties of bigamy and polygamy (qq.v.).

The earliest Roman laws were distinguished for the strictness with which they treated marriage.

They not only upheld thoroughly the principle of monogamy, but they fettered marriage itself with many burdensome forms. Hence arose the practice of a free unmarried man entering into a less strict relation with a single woman—a sort of permanent cohabitation. The offspring of such a connection, called 'natural' children, had not the rights of legitimate children, but they were recognized by the father. Augustus, with a view to promote regular marriages and check the growing licentiousness, enacted a comprehensive marriage-law (*Lex Julia*), which discouraged concubinage, restricting it to women of low rank or those who had lost their station. Christianity required the complete sanctity of marriage and taught that concubinage was sinful, and we find the Synod of Toledo legislating against it as far back as A.D. 400. The ancient laws of the Germans recognized, along with regular marriage, an informal connection of the sexes. In the Middle Ages a similar connection became customary, called a 'left-handed,' or morganatic marriage. See MARRIAGE, and consult the authorities there referred to.

CONCURRENCE (ML. *concurrentia*, concurrence, from *concurrere*, to run together, from *com.*, together + *currere*, to run) AND **COLLINEARITY** (from Lat. *com.*, together + *linca*, line). If several lines have a point in common they are said to be concurrent. The common point is called the focus or vertex of the pencil of lines. If several points lie on one straight line they are said to be collinear. The line is called the base of the range of points. That portion of geometry concerned with concurrent lines and collinear points is called the theory of concurrence and collinearity. Some of its fundamental propositions are:

If a transversal intersects the sides of a triangle ABC in the points X, Y, Z, the segments of the sides of the triangle are connected by the relation $(AZ:ZB) \cdot (BX:XC) \cdot (CY:YA) = -1$. Conversely, if the points be so taken that the relation holds, then the three points are collinear. (This relation is known as Menelaus's theorem.)

If the three lines AO, BO, CO drawn from the vertices of the triangle ABC are concurrent in O and meet the opposite sides in X, Y, Z, then $BX \cdot CY \cdot AZ = -CX \cdot AY \cdot BZ$, and conversely (Ceva's theorem).

If three lines perpendicular to the sides of a triangle ABC at X, Y, Z are concurrent, then $BX^2 - XC^2 + CY^2 - YA^2 + AZ^2 - ZB^2 = 0$.

Conversely, if this relation holds, the perpendiculars are concurrent.

If the lines joining the vertices of two triangles are concurrent, their corresponding sides intersect in three collinear points. (This proposition, known as Desargues's theorem, is true for any rectilinear figures.)

The opposite pairs of sides of a hexagon inscribed in a conic intersect in three collinear points (Pascal's theorem).

The lines joining the opposite vertices of a hexagon circumscribed about a conic are concurrent (Brianchon's theorem).

The polars of a range of points with respect to a circle (q.v.) are concurrent, and conversely.

If from any point on a circle perpendiculars are drawn to the sides of an inscribed triangle, their feet are collinear. (The base of this range is called Simson's line.)

From these and other similar theorems, many

properties of elementary geometry follow at once; as, the altitudes of a triangle are concurrent, the medians of a triangle are concurrent, etc. The theorems of Pascal and Brianchon lead to numerous theorems in modern geometry. Consult: Cremona, *Elements of Projective Geometry*, trans. by Leudesdorf (Oxford, 1885); Casey, *Sequel to Euclid* (Dublin, 1888); Beman and Smith, *New Plane and Solid Geometry* (Boston, 1900); McClelland, *Geometry of the Circle* (New York, 1891).

CONCURRENT JURISDICTION. The jurisdiction that exists where two or more courts possess the equal and coördinate right of taking cognizance of a single cause. Thus in the United States, a justice's court and a city court may often take cognizance of the same matter; or a court of common pleas and a superior court may do the same. In criminal cases it is an established rule that when one court has brought an offender before it, the court having concurrent jurisdiction is thereby debarred from taking cognizance of the case. In civil trials it is the privilege of the person appealing to the law—that is, in most cases, the plaintiff—to choose before which of the two coördinate courts he wishes to bring the matter. The phrase concurrent jurisdiction is used in opposition to *private*, or exclusive, jurisdiction, i.e. where only one court has the right of hearing and determining the matter at issue.

In the political system of the United States, with its Federal courts exercising jurisdiction over the same persons as are subject to a local State jurisdiction, the occurrence of cases of concurrent jurisdiction is very common. Where it exists, a decision of a State court may, in a proper case, be taken up to the Supreme Court of the United States for review. See COURT; JURISDICTION.

CONCUSSION FUSE. See FUSE.

CONCUSSION OF THE BRAIN (Lat. *concussio*, shock, from *concutere*, to shake together, from *com.*, together + *quaterere*, to shake). The name given to a group of symptoms which result from injuries to the head, but are not due to fracture or to perceptible laceration of vessels or brain substance. The condition has been widely discussed and extensively studied by many means of experimentation, but authorities still disagree as to whether it is due to laceration of minute blood-vessels, to altered vibratory changes in the molecules of the brain-cells, or to a change in the disposition of the cerebro-spinal fluid. At present, almost all surgeons deny that concussion of itself is fatal, and autopsies show almost invariably some apparent lesion of vessels or brain substance in those fatal cases which have simulated concussion, but which were really instances of contusion or laceration. The symptoms vary in mild and severe cases. In the former, when the patient is 'stunned' by a fall or a blow on the head, there is dizziness, disturbances of vision and noises in the ears, loss of strength, so that the patient falls, the face is pale and covered with a cold perspiration, the respiration is shallow, the pulse feeble and often slower than normal. In graver cases these symptoms become intensified, or the most extreme symptoms may develop instantly. There is complete unconsciousness, the body is cold and relaxed, the pupils widely dilated and unresponsive to light, the

respiration scarcely distinguishable, the pulse weak, irregular, and slow. Vomiting is also frequent. This condition may last for several hours or even for a day or more, after which reaction slowly occurs, and recovery is complete. Frequently the symptoms of contusion or hemorrhage may follow, and the subsequent history becomes that of severe brain injury. Protracted symptoms of concussion are usually regarded as suggestive of a more serious injury. The treatment is expectant; it consists in the application of warmth to the body, stimulation of respiration and pulse if necessary, and in keeping the patient in absolute quiet. A surgical operation is, of course, not indicated in pure concussion, but only in such cases as give symptoms of gross brain lesions. See SHOCK.

CONDAMINE, CHARLES MARIA DE LA. See LA CONDAMINE.

CONDÉ, KŌN'dá', FAMILY OF. One of the great families in France, and a branch of the House of Bourbon. It took its name from the town of Condé. (See CONDÉ-SUR-L'ESCAUT.) The first to bear the title of Prince de Condé was Louis, the youngest son of Charles de Bourbon, Duke of Vendôme. (See below.) The family became extinct in 1830. It gave many famous men to France, of whom the following are the most noted:

LOUIS I. DE BOURBON, Prince de Condé (1530-69), appears in 1549 as gentleman of the royal bedchamber. He distinguished himself at the siege of Metz (1552), and in the battle of Saint Quentin (1557). But the Court was under Guise influence, and no Bourbon could expect advancement. Condé, who had early imbibed Protestant ideas, threw in his lot with the Huguenots on the accession of Francis II. in 1559. He took part in the conspiracy of Amboise, formed by the Huguenots for the overthrow of the Guises. The capture and imprisonment of the chief Huguenot leaders followed, and Condé only escaped execution through the opportune death of the King. The balance of power rested in the hands of Catherine de' Medici (q.v.), who liberated Condé and made him Governor of Picardy. After the massacre of Vassy (1562), Condé and Coligny took up arms against the Guise faction, but they were defeated at Dreux in the same year, and Condé was taken prisoner. He was, however, liberated in the year following by the pacification of Amboise. Owing to fresh persecution, the Huguenots again took up arms in 1567; an unsuccessful attempt to seize the person of the King was followed by the indecisive battle of Saint Denis, in which the Catholic leader, the Constable de Montmorency, was slain, and in 1568 another treaty of peace was made. Condé, however, learning of Court intrigues against his liberty, renewed the conflict. The battle of Jarnac (March 13, 1569) resulted most disastrously for the Huguenots. Condé rashly exposed himself and was wounded and taken prisoner. While his wounds were being dressed he was assassinated by Montesquieu, a Swiss mercenary captain, possibly at the command of the Duke of Anjou, whom Condé had offended. "He was distinguished," says the Duc d'Aumale, "by great ardor and gaiety, the desire and the gift of being pleasant, by a resolute character, a proud soul, and a great and generous heart." Of the four sons who survived him, the eldest, Henri I. (1552-88), joined the Huguenot cause,

but renounced his religion to save his life at the time of the massacre of Saint Bartholomew. He again took up arms for Protestantism in 1585, and was excommunicated by Pope Sixtus V. After several successful encounters with the forces of the League, Condé was wounded at Coutras (October 20, 1587) and died a few months later, not without grave suspicions of foul play on the part of his wife and attendants. The legitimacy of his only son, Henri II. (1588-1646), was a matter of great dispute; but finally he was allowed to succeed to the titles and estates of his father, and, for a time at least, was looked on as the heir presumptive to the French crown. This contingency was removed by Henry IV.'s second marriage and the birth of the Dauphin Louis (1601). After a life at Court, devoted to the aggrandizement of his family, and marked by opposition to the Huguenots, Henri II. de Condé died in 1646. He was the father of the Great Condé.

LOUIS II. DE BOURBON (1621-86) is known in history as 'the Great Condé.' After a thorough education in the Jesuit seminary at Bruges the young prince, who was known as the Duc d'Enghien during the lifetime of his father, was introduced at Court, and the next year, at the age of eighteen, was made Governor of Burgundy. To further his father's political aims, he was forced, in 1641, to marry the niece of Richelieu, much against his inclination. Meanwhile he had entered the military service and distinguished himself in the Netherlands, but his great triumph came in 1643, when, at the battle of Rocroi, he outmaneuvered the Spanish infantry, raised the siege, and inflicted a severe defeat on the enemy. Other successes followed, and Condé was promoted and sent to Alsace, in the summer of 1643, to cooperate with Turenne. After the victory of Freiburg, the capture of Philippsburg, Mainz, and other cities on the Rhine, Condé returned in triumph to Paris for the winter, but in 1645, after the defeat of Turenne by Mercy, he again took the field and by his splendid dash and energy won a series of victories culminating in that of Nördlingen in 1645, where Mercy was killed. Associated with the Duke of Orléans in the Netherlands in 1646, Condé won several brilliant victories. The death of his father in the same year made him head of the Condé family and gave him possession of vast estates and a large fortune, and made him the highest personage in the State after the King and the Duke of Orléans. Though feared by Mazarin, Condé was given the chief command in the Netherlands and made captain-general of the French forces. The victory at Lens in 1648 added to his fame and he was recalled to Paris to suppress the rising of the Fronde (q.v.). After many intrigues, plots, and counter-plots the Court returned to Paris. Condé's haughtiness of manner and dictatorial measures, however, soon alienated the Queen and nobles, and by the advice of Mazarin he was arrested, with other members of his family. The threatened advance of Turenne, the murmurs of the Fronde, and the activity of friends, soon secured Condé's release. The discomfiture and flight of Mazarin again brought Condé to the front, but the failure of the Court to fulfill its promises and the suspicions he entertained that his assassination was contemplated roused him to fresh rebellion in 1651. His former ally, Turenne, was now on the

side of the Court, and after Condé had won the battle of Bléneau (April, 1652) and advanced on Paris, he was met by Turenne at the head of the royal troops. A bloody and indecisive conflict ensued, the net result of which was so to weaken the Frondeurs that most of them consented to a treaty of peace. Condé, however, rejected the proffered terms, and after a vain effort to retrieve his cause and seize Paris, went over to Spain. In the war which followed he acted as commander-in-chief of the Spanish forces in Flanders, but could gain no advantage over Turenne, who opposed him. When the peace of the Pyrenees was made (1659) Condé was pardoned and again entered the service of France. In 1673 he commanded in the Netherlands, and the next year fought a drawn battle at Seneffe with William of Orange. This was the great general's last important battle, though in 1675 he succeeded Turenne, on the latter's death, in command of the army on the Rhine. Disabled by gout, he resigned his post and retired to his estate at Chantilly. There he became a devout Roman Catholic, and occupied himself during his remaining years with literature, religion, and the society of his friends. He was intimate with Molière, Racine, Boileau, Bossuet, and La Bruyère. He died at Fontainebleau on December 11, 1686, and his friend Bossuet pronounced the now famous *Oraison funèbre* over his bier. Though proud, and acting always from motives of selfish ambition, Condé was without doubt one of the greatest men of his time. The only surviving son of the Great Condé, Henri Jules (1643-1709), inherited some of the ability of his father and played a more or less important part in the history of his time, while his grandson, the Duke de Bourbon, known as *Monsieur le Duc*, was a prominent figure at the time of the Regency.

LOUIS JOSEPH DE BOURBON, Prince de Condé (1736-1818), the son of the Duke de Bourbon, was born in Paris, August 9, 1736. He distinguished himself in the Seven Years' War at Minden, Gemmingen, and Johannisberg. At the outbreak of the Revolution he showed himself a strong supporter of the monarchy, and in 1792 took up arms against the Republic, organizing on the Rhine a body of *émigrés*, which cooperated with the Austrians, and was known as 'the army of Condé.' After the peace of Campo Formio (1797), he entered the Russian service, and in 1801 fought in that of England. In that year he took up his abode in England, where he remained until the Restoration. His last years were spent at Chantilly, and he died there May 13, 1818. He was the author (1798) of an *Essai sur la vie du grand Condé*. His son Louis Henri Joseph (1756-1830) was the last of the Condé princes. He was wounded at the siege of Gibraltar in 1782 and later served under his father against France. His eldest son was the hapless Duc d'Enghien, executed in 1804 by order of Napoleon. After the Restoration Condé settled his fortune on the Duc d'Aumale, son of Louis Philippe, but in 1830 seemed to have thought of changing this will. Before doing so, however, he was found strangled, and it was judicially decided that he had committed suicide, though no satisfactory evidence was produced and the verdict was an open one.

Consult: Duc d'Aumale, *Histoire des princes de Condé XVIIe and XVIIIe siècles* (7 vols., Paris,

1863-96); vols. i. and ii. translated into English by R. B. Borlase (London, 1872); Lord Mahon, *Life of Louis, Prince of Condé* (London, 1845); Fitzpatrick, *The Great Condé and the Period of the Fronde* (2d ed., London, 1874); Crétineau-Joly, *Histoire des trois derniers princes de la maison de Condé* (Paris, 1866); Muret, *L'histoire de l'armée de Condé* (Paris, 1844).

CONDELL, kām'dēl, HENRY (? -1627), and HEMING, JOHN (? -1630). English actors, whose names are forever linked with Shakespeare's. They both belonged to Shakespeare's company, and, with Burbage, were joint owners of the Globe Theatre. Like Shakespeare, they amassed fortunes from their profession. The great dramatist, as a token of lifelong friendship, bequeathed to them and Burbage 26s. 8d. to buy rings. And they in turn collected and edited his plays, 'to keep the memory of so worthy a friend and fellow alive' (first folio, 1623).

CONDEMNATION. See EMINENT DOMAIN.

CONDENSED MILK. See MILK.

CONDENSER (from Lat. *condensare*, to thicken, from *com-*, together + *densus*, thick, Gk. *δαρός*, *dasys*, thick). Any device for reducing gas or vapor to a liquid or solid form is termed a condenser, though the name is applied specifically to a variety of apparatus used in the arts besides appliances for condensing gases and vapors, as the part of a cotton-gin which compresses the lint; a machine which takes the wool coming from the carding engine and rolls it into slightly twisted threads or slubbings ready for spinning; the arrangement of steam-pipes used in sugar-mills to evaporate the water in the cane-juice preparatory to concentration. Condensers in steam engineering are apparatus for condensing the exhaust steam from an engine. They are employed on shipboard, invariably in ocean steamers, and very generally in fresh-water craft, but are seldom used on stationary land engines and almost never on locomotive or portable engines. The two forms of steam-condensers are the jet condenser, now seldom used, and the surface condenser. The jet condenser consists essentially of an air-tight chamber into which the exhaust steam flows, and is brought into contact with a spray of water whose action is to turn the steam to water, which falls to the bottom of the chamber and is pumped away by an air-pump. With the jet condenser the condensed steam is necessarily mixed with the water of the spray, which in ocean steamers is always seawater, so that it is always salt and thus objectionable for boiler-feeding purposes. To remedy this objection, the surface condenser was invented, and consists essentially of a vessel containing brass tubes through which the exhaust steam is passed, and around which a current of cold water is kept in circulation, thus keeping separate the condensed steam and the salt condensing water. See STEAM-ENGINE.

CONDENSER. A form of electrical apparatus used to accumulate a charge of electricity, or, in other words, to store up electrical energy. A condenser in its simplest form consists of two conductors which are separated from each other by an insulating medium or dielectric, and is illustrated by the Leyden jar or Franklin plate. The name dates from the time of the fluid theory of electricity, when it was believed that a certain

amount of the electric fluid could be collected or condensed on a conducting surface. The principle of the apparatus is illustrated in the Franklin plate, which consists of a plate of glass with pieces of tin-foil on each side. If a positively charged body or the positive conductor of an electric machine is connected with one of the tin-foil coatings, it will communicate to it by conduction a positive charge of electricity. If now the opposite plate is connected with the ground, the negative electricity is held bound, while the positive is repelled and passes to the ground. Accordingly we have accumulated equal amounts of positive and negative electricity on the tin-foil, and if the two surfaces are connected a bright spark results and the equilibrium is restored. Otherwise, the charge remains on the surface of the conductors until it is dissipated by leakage. The energy which is stored up in the condenser is expended in producing the spark. The amount of electricity that can be accumulated depends upon the capacity of the condenser and the potential of the charge. The Leyden jar consists of a Franklin plate in a cylindrical form, and as it is more compact and has greater capacity, it is more often used. In practice, however, the usual form of condenser consists of sheets of tin-foil separated from each other by paraffined paper, or in the case of standard condensers sheets of mica, with the alternate sheets of tin-foil connected together to give considerable capacity. The apparatus may be arranged so as to afford various amounts of capacity, and is much used in cable-testing and other branches of electrical work. The unit of capacity is the farad (q.v.), but condensers are generally constructed to give capacities in fractions or multiples of a micro-farad ($\frac{1}{1000000}$ farad), which is the unit ordinarily employed. See ELECTRICITY.

COND'ER, JOSIAH (1789-1855). An English author. He set up as a bookseller in London in 1811, and became proprietor and editor of the *Eclectic Review* in 1814 and editor of the *Patriot* newspaper in 1832. He published many works on religious, political, and miscellaneous subjects. The most popular of these was his *Modern Traveler* (1825-29), a series of 30 volumes descriptive of the various countries of the globe, of remarkable accuracy, though the author never traveled outside of his native country.

CONDÉ-SUR-L'ESCAUT, kōn'dá' sur lá'skó' (Fr., Condé on the Scheldt, from Gall. *condat*, confluence + Fr. *sur*, on + *Escaut*, Scheldt). A town in the Department of Nord, France, at the confluence of the Haine and the Scheldt and on the Condé-Mons Canal, eight miles northeast of Valenciennes. It dates from the Roman period and gave its name to the noble family of Condé. It has an interesting castle, a church, an arsenal, and strong fortifications constructed by Vauban. It manufactures starch, chicory, leather, and soap. Population, in 1901, 4130; commune, 4960.

CONDÉ-SUR-NOIREAU, nwä'ró'. A town in the Department of Calvados, France, on the Noireau River, 33 miles south-southwest of Caen by rail (Map: France, F 3). Among its notable features are the two venerable churches of Saint Sauveur and Saint Mark, and a bronze statue of Dumont d'Urville, the famous navigator, a native of the town. It is an ancient town and a busy industrial centre, with cotton-spinning factories, manufactures of cutlery and

leather, and an important trade in cattle, honey, and other agricultural products. Population, in 1901, 6591.

CONDILLAC, kōn'dé'yák', ETIENNE BONNOT DE (1715-80). A French philosopher. He was born at Grenoble, and in 1768 became a member of the French Academy of Sciences. He never attended the meetings of the Academy after his reception as a member, and passed his life mostly in great retirement. He died at his estate near Beaugency. In 1746 he published his *Essai sur l'origine des connaissances humaines*, a work which represented the views of Locke (q.v.). In his later works he carried out the sensational side of Locke's philosophy with great consistency. He believed that "the ego of each man is only the bundle of the sensations he experiences and of those which memory recalls." He illustrated his view by describing an imagined growth in the consciousness of a marble statue as it received one by one various sense faculties. In addition to his first essay, he wrote: *Traité des systèmes* (1749); *Recherche sur l'origine des idées que nous avons de la beauté* (1749); *Traité des sensations* (1754); and *La logique* (1781), besides thirteen volumes of textbooks he had prepared when tutor to the Duke of Parma, grandson of Louis XV. Consult: Dewaule, *Condillac et la psychologie anglaise contemporaine* (Paris, 1892); Lewes, *History of Philosophy* (London, 1880); Réthoré, *Condillac ou l'empirisme et le rationalisme* (Paris, 1864); Robert, *Les théories logiques de Condillac* (Paris, 1869).

CONDIMENTS (Lat. *condimentum*, from *condire*, to season, from *com-*, together + *-dere*, Skt. *dhā*, to put). Seasoning agents, or substances employed at table for the purpose of imparting a flavor or seasoning to the ordinary solid or liquid food. The greater part of condiments are necessary to sustain the proper functions of the alimentary system, and, besides gratifying the appetite, minister, more or less, to the wants of the structure. The principal condiments are saline substances, such as common salt; acidulous bodies, such as acetic acid or vinegar; oily condiments, such as butter and olive-oil; saccharine substances, such as sugar and honey; and aromatic and pungent condiments, such as mustard, ginger, pepper, and pickles.

CONDITION (OF. *condicio*, Fr. *condition*, from Lat. *condicio*, agreement, from *condicere*, to agree, from *com-*, together + *dicere*, to say). The popular name in American college parlance for a deficiency on the part of a student in examinations (q.v.). It derives its force from the fact that the student is permitted to go on with his class only on *condition* that the deficiency be made good within a given time, failing which his name is dropped from the college rolls.

CONDITION. In natural science and metaphysics, that in default of which a phenomenon does not occur. (See CAUSALITY.) In logic it denotes any qualification of the universal validity of a statement. See LOGIC.

CONDITION and **CONDITIONAL**. As a legal term, condition signifies a provision in a contract, conveyance, grant, or will, that an estate or interest in property, or a personal obligation, shall depend upon the happening of an uncertain event. The term is also applied to the

event itself. If the condition is set forth in words it is called an *express* condition; if it is inferable from the circumstances of the particular case it is called an *implied* condition. In English law conditions are also classified as conditions *precedent* and conditions *subsequent*. An example of the former is the grant of an estate to A upon condition that he marry B; or the contract to charter a ship upon condition that it is in the port of Amsterdam. Here the event named must happen before the estate vests in A, or the contract obligation on the part of the hirer of the ship arises. An example of a condition subsequent is the grant of an estate to A upon condition that he continues to reside in a particular place; or the purchase of a piano upon condition that it shall 'stand up to correct pitch' for a year. Here the estate in A, or the obligation of the purchaser to keep and pay for the piano is annulled upon the non-performance of the condition. Impossible, illegal, or repugnant conditions are void. Accordingly, says Blackstone, "if they be conditions subsequent, the estate shall become absolute in the tenant, for he hath by the grant the estate vested in him, which shall not be defeated by a void condition. But if the condition be precedent, he shall take nothing by the grant, for he hath no estate until the condition is performed."

A provision in a contract which is intended to operate as a condition in favor of one party may contain a binding promise of the other party. For example, A agrees to sell and deliver to B at a named time, place, and price a certain quantity of merchantable corn; and A tenders unmerchantable corn at the agreed time, place, and price. B has the right not only to reject the corn, because the condition precedent to deliver merchantable corn has not been performed by A, but also to recover from A damages for breach of contract to deliver the agreed corn. Such a provision in a contract may be called a promissory condition. Of this class are the mutual promises of the seller to deliver the goods and of the buyer to pay for them—engagements which are sometimes called 'concurrent conditions.' Promissory conditions have been confused with warranties (see WARRANTY) by many judges and writers, but the English Sale of Goods Act of 1893 makes a sharp distinction between the terms, and has done much to clear up the confusion in this branch of the law. See SALE.

Another and distinct class of provisions in contracts may be styled *casual* or *contingent* conditions, because they are intended to prevent any obligation attaching to either party until their performance. An example of this class is afforded by an agreement for the sale of described goods to arrive by a specified ship. Here, if the ship does not arrive, or, if arriving, it has not the described goods on board, neither party is bound.

The word *conditional* frequently appears in standard legal phrases, some of the more important of which are the following: *Conditional acceptance* (of a bill of exchange) is an acceptance in which payment by the acceptor is dependent upon the fulfillment of a condition therein named. *Conditional advance note*, that is, a note given by the master of a ship to a seaman, payable after the ship sails upon condition that the seaman goes with the ship. *Conditional allotment*, *conditional application*, that is, the

allotment of shares in a company, or the application for shares, made upon a specified condition. In the former case the applicant is not bound to take the shares unless he has assented to the condition, nor in the latter case unless the condition is performed. Consult: Blackstone, *Commentaries on the Laws of England*; Benjamin, *Treatise on the Law of Sale of Personal Property* (7th ed., Boston, 1899); Burdick, *Law of Sale of Personal Property* (2d ed., Boston, 1901); consult also the *Cyclopadia of the Laws of England*, vol. iii. (London, 1897).

CONDITIONAL FEE. At common law, an estate granted to a man and the heirs of his body. This limitation to a particular line of heirs, to the exclusion of collateral lines, was interpreted by the courts merely as a condition diverting the estate in the event that no issue was born answering the description of the grant, and the fee thus came to be known as a conditional fee. The condition being performed by the birth of issue, such estates became absolute and might then be alienated to strangers and the expectations of the issue defeated. As conditional fees were a device of the great landowners to preserve their estates intact for their lineal descendants, they procured the enactment of a statute by Parliament forbidding such alienation and preserving the interests of the issue as well as of persons to whom the property was to go on failure of issue. This was the famous statute of Westminster II. (1285), known as the statute *De Donis Conditionalibus* ('concerning conditional gifts'), which had the effect of converting such estates into fees tail and of preventing the evils at which it was aimed until, by the ingenuity of the lawyers and judges, other means were devised for barring entails and alienating such estates. See CONDITION; COMMON RECOVERY; FEE TAIL; FEE SIMPLE; FINE. Consult the authorities referred to under FEE SIMPLE and FEE TAIL.

CONDITIONAL IMMORTALITY. The doctrine advanced by certain theologians that the immortality of the soul is conditional only upon faith in Christ, and that immortality is not inherent in the race. See ANNIHILATIONISM.

CONDITIONAL LIMITATION. A fee simple estate limited or qualified (a) so as to come to an end on the happening of a collateral event, or (b) so as to shift from one owner to another on such an event. The expression conditional limitation is used in both these senses by different law-writers of great authority, and it is therefore impossible to affix to it a precise definition. The first use of the phrase identifies it with the limited or qualified fee simple, as a gift of land to A and his heirs so long as they shall continue to live on the premises, or so long as Saint Paul's Church shall stand, or until the happening of any other event. Under the early common law the donor of such an estate had an interest left—notwithstanding the estate conveyed was a fee simple—known as a 'possibility of reverter,' and, upon the happening of the event specified in the deed, the property would revert or return to the donor or his heirs. This contingent interest remaining in the donor of a qualified fee has been referred to the feudal relation of lord and tenant, which might subsist between the grantor and grantee of a fee, and it has been supposed that the statute *Quia Emptores* (1290),

which did away with this feudal relation, thereby destroyed also the grantor's possibility of reverter, and converted every qualified fee into an absolute fee. But it has been held, nevertheless, in two States (New York and Massachusetts) of the United States, that qualified fees of this type are still good, and that they will revert to the grantor and his heirs on the happening of the event on which they were conditioned, and these decisions are likely to be followed in the United States. But neither at the common law nor today has the grantor of such a fee any interest which he is capable of alienating to any other person prior to the return of the estate to him.

The second meaning of the expression conditional limitation makes it a convenient phrase for the commoner terms executory devise and shifting use. While at the common law a gift of a fee simple—even though qualified as above described—was supposed to exhaust the whole power of alienation, if not the entire interest, of the donor, leaving him no capacity to give the property over, on the happening of a future contingency, to another; yet, as a result of the Statute of Uses (passed in 1527) and the Statute of Wills (enacted in 1532) it became possible to make a fee which should, upon a specified future event, shift to another. Thus, if land be devised by will to X and his heirs on condition that they shall forever maintain their citizenship in New York, with the further proviso that in the event of a failure to comply with the condition within the lives of the donor's children the property should go over to a charity, the last-mentioned gift might take effect as an executory devise, or conditional limitation on the prior gift. Such limitations on fees are now very common, and may, under modern statutes, usually be effected by a simple deed of grant, without invoking the aid of the Statute of Uses. See DEVISE; ESTATE; FEE SIMPLE; FEUDAL SYSTEM; SUBINFEUDATION; USE; WILL; and the authorities referred to under those titles.

CONDOM, kōn'dōn'. A town in the Department of Gers, France, on the river Baise, here crossed by two bridges, 25 miles north-northwest of Auch (Map: France, G 8). The town, founded in 721, is irregularly built, but has handsome suburbs. It has a fine Gothic cathedral (1506-21), adjoined by the remains of an old cloister, an exchange, and hospitals. There is a very considerable trade in grain, flour, wine, and especially in Armagnac brandy, and manufactures of cotton, cotton yarn, etc. Bossuet was at one time Bishop of Condom. Population, in 1901, 6578.

CONDONATION (Lat. *condonatio*, from *condonare*, to pardon, from *com-*, together + *donare*, to give, from *donum*, Skt. *dānu*, gift, from Lat. *dare*, Gk. *δίδοναι*, *didonai*, OChurch Slav. *dati*, Lith. *duiti*, Skt. *dā*, to give). In law, forgiveness of an act by a husband or wife, which entitles the forgiving party to a divorce. Condonation may be either expressed or implied. If the parties have cohabited after a knowledge of the offense complained of, this is an implied condonation of the offense, and bars complaint unless the offense shall have been subsequently repeated. An act once condoned is, in the eyes of the law, as though it had never been committed, unless the guilty party repeats the offense, in which event the old offense becomes a valid

ground of complaint. In other words, condonation is always conditional upon the discontinuance of the condoned misconduct. See DIVORCE.

CONDOR (Sp., from Peruv. *cuntur*, condor). The great vulture (*Sarcoramphus gryphus*) of the Andes, and the largest of known flying birds, unless the albatross may sometimes exceed it. Its dimensions, however, have often been far overstated, the truth being that it varies in length from 44 to 55 inches, and in expanse of wing from 8½ to 10½ feet. The wings are long and extremely powerful; the tail short, and wedge-shaped; the general color black, which is brightest in old males, which have much white in the wing. The young are brownish. Around the lower part of the neck of both sexes there is a broad white ruff of downy feathers, above which the skin is bare and exhibits many folds. The head of the male is crowned with a large, reddish, cartilaginous comb, and the neck is furnished with a dilatable wattle. The beak is thick and strong, straight at the base, but the upper mandible strongly curved at the extremity. The condor feeds mostly on carrion. Its voracity is enormous. Tschudi mentions one in confinement at Valparaiso which ate eighteen pounds of meat in a single day, and seemed next day to have as good an appetite as usual. Condors often gorge themselves so that they cannot fly, and, if attacked, must disgorge in order to escape. They inhabit regions 10,000 or 15,000 feet above the level of the sea, where they are usually seen in small groups, and where they breed, making no nest, but laying their eggs on the bare rocks. To these haunts they return, after their descent into the plains for food. The height to which the condor soars in the air exceeds that of any other bird, and is often far above the clouds.

Closely related to the condor, but distinguished by differences in the cartilaginous comb, bare neck, and shape of the bill, are the king vulture, or king of vultures (*Gyparchus papa*), of the warm parts of America, and the Californian vulture (*Pseudogryphus Californianus*). The king vulture is about the size of a goose, and derives its name from its driving away other vultures from prey at its pleasure. Its plumage is finely colored, reddish above, white beneath, with bluish-gray ruff, and black quills and tail. The Californian vulture is often longer and of greater expanse of wing than the condor, but is not so heavy a bird. It is duller colored, and has less white on the wings. Its range was restricted to the Pacific coast region, from Oregon southward; it was nowhere really common, and it has now become extinct, except possibly in Lower California. Like other American vultures, it has no voice, the only sound that it utters being a hoarse hiss or sort of weak snorting. All these large American vultures belong to the family Cathartidae, which includes the turkey-buzzards, and is less falconine than the Old World vultures. See VULTURE and Plate of VULTURES; and EXTINCT ANIMALS.

The first satisfactory account of the condors was given by Hnhholdt. Consult: Darwin, *A Naturalist's Voyage* (London, 1860); Stejneger, *Riverside Natural History*, vol. iv. (Boston, 1885); Lucas, *Annual Report of United States National Museum*, 1889 (Washington, 1891).

CONDORCANQUI, kōn'dōr-kān'kwé. José GABRIEL. See TUPAC AMARU II.

CONDORCET, kôn'dôr'sâ', MARIE JEAN ANTOINE NICOLAS CARITAT, Marquis de (1743-94). A French mathematician and philosopher. He was born at Ribemont, was educated by the Jesuits, won distinction for mathematics in his youth, and became an active member of the Academy of Sciences in 1769. Genial, susceptible, and enthusiastic, he became allied with the advanced thinkers and shared in the economic and religious propaganda of Turgot, D'Alembert, and Voltaire. He took an active part in the *Encyclopédie*, and, on the strength of his graceful *Éloges des académiciens morts avant 1699* (1773), he was made the perpetual secretary of the Academy of Sciences in 1777. He became a member of the French Academy in 1782. His *Éléments du calcul des probabilités* (1785), revised and enlarged in a posthumous edition (1804), was his most important contribution to mathematics. From this time politics claimed him in increasing measure. He wrote a life of Turgot (1786), and of Voltaire (1787), and was chosen member of the National Assembly from Paris, becoming secretary of that body, and in February, 1792, its president. He composed several of its most important addresses, and elaborated a scheme of public instruction. Though finding Louis XVI. guilty, he refused to vote for his execution. He was active in framing the Constitution submitted to the Convention in February, 1793, but his opposition to the Terrorists led them to proclaim him an outlaw. Friends found him a refuge with a Mme. Vernet, who said "the Convention could declare him outside the law, but not outside humanity." Tracked hither at last, he escaped, was captured at Clamart, and died in prison at Bourg-la-Reine, March 29, 1794, from apoplexy, exhaustion, or poison. While with Mme. Vernet he wrote the *Esquisse d'un tableau historique des progrès de l'esprit humain*, a declaration of human perfectibility through emancipation from priests and rulers, narrow in its sensationalist philosophy and fanatic in its anti-spiritualism, but interesting for its militant optimism. Condorcet's Works (Paris, 1847-49) contain a Life by Arago. Consult Morley, *Critical Miscellanies* (London, 1893).

CONDOTTIERI, kôn'dô-tyä'rê (It., plur. of *condottiere*, captain, leader). The name given in Italy in the Middle Ages to the leaders of companies of military adventurers who offered their services to any party in any contest for pay and often practiced warfare on their own account, for the sake of plunder. The name is frequently applied also to the members of their companies. These mercenaries were called into being by the endless feuds of the Italian States during the Middle Ages. Among the most celebrated of their leaders were Sir John Hawkwood (c.1320-94), the commander of the famous White Company, who, after taking an important part in the wars between England and France, crossed into Italy and became Captain-General of Florence; Carmagnola (c.1390-1432), who fought in the pay of Milan and Venice; and Francesco Sforza (1401-66), who in 1450 made himself Duke of Milan, to the exclusion of the lawful heirs of the Visconti. Venice began to employ condottieri in 1143; but their time of greatest activity was in the fourteenth and fifteenth centuries. Machiavelli paints them in the most unfavorable light, and states that sometimes battles were fought by two condottieri in which no one

was killed except by accident. Consult Ricotti, *Storia delle compagnie di ventura* (Turin, 1845).

CONDUCTING TISSUE. In botany, the lines, strands, or groups of conducting cells used for transferring water and foods from one part of the plant to another. See CONDUCTION.

CONDUCTION (Lat. *conductio*, union, from *conducere*, to lead together, from *com-*, together + *ducere*, to lead, connected with Goth. *tiuhan*, AS. *tēon*, OHG. *ziohan*, Ger. *ziehen*, to draw). In botany, a term applied to the transfer of water, foods, and other materials from one part of the plant body to another. In the smaller plants a sufficient amount of water can be supplied to cover evaporation and other needs, and the foods can be transferred, by relatively slow processes of diffusion and osmosis (q.v.). In the larger plants, however, the amount of water and foods to be moved, and the relatively great distances to be traversed, have brought about the development of a system of tissues, arranged in elongated strands or in layers, specially adapted to facilitate transfer, and known as the conducting system. These are for water chiefly the xylem, or wood bundles, and for foods chiefly the phloëm, or bast bundles, or perhaps the latex vessels. The xylem and phloëm bundles are usually associated, running side by side in the stems, the xylem either toward the centre, or with a phloëm bundle also on the central side of it, or surrounded by the phloëm. In the roots the primary xylem bundles are between the phloëm bundles, but by secondary thickening with age the same position as in stems is reached. So frequent is this association that the two bundles are usually described as regions of one fibrovascular bundle (q.v.). These bundles form a connected system of strands, continuous, through the stem, from youngest root to youngest leaf. In the leaves the bundles run in the larger ribs, and constitute the smaller veins, becoming more and more slender. The final branches join with others to form a fine network, or end blindly among the green tissues, the xylem bundles being the last to disappear.

THE XYLEM AND WATER-CONDUCTION. The essential elements of the xylem are the tracheæ or tracheids, with which parenchyma cells and wood fibres are usually associated. The tracheids are cells whose walls have become unequally thickened as they mature; their protoplasm finally disappears, leaving only the empty cell-wall. The tracheæ are similar, except that a large number of the end walls, where the elements of a row abut, have been resorbed, so that the cell-chambers, empty as they finally become, communicate freely. The tracheæ, where best developed, are thus long tubes, half a millimeter (1-50 inch) or less in diameter, and 1 to 3 meters (3 to 10 feet) long. The remaining elements of the xylem are of less importance for conduction. (See ANATOMY.) Through the xylem bundles the water absorbed by the roots travels to the leaves and other surfaces, from which it is evaporated. The water first enters the root-hairs or the adjoining surface cells of the root (see ABSORPTION and ROOT); thence it traverses the cortex and enters the tracheary tissue, and travels along it to its destination. Proofs that the xylem bundles are the path of the transpiration stream are found by girdling and by the use of colored solutions. When the xylem bundles are severed the leaves wilt promptly, while all the other tissues of the

stem may be cut without such a result. A solution of indigo-carmin or eosin stains only the xylem strands when the cut end of a leafy shoot is plunged into it. It has further been shown that the water travels chiefly in the cavities of the tracheæ, though doubtless a portion traverses the walls themselves, and all must pass through many partition walls in its course. The movement is not at all like that of water in pipes or blood in vessels. The force concerned in the movement of water is not certainly known. In the smaller plants, root-pressure (q.v.) may cooperate, or under some circumstances may be sufficient; but it is not adequate to account for the rise in tall trees. Capillarity is to be excluded, since the conditions under which surface tension operates to raise water in small tubes are not present. Evaporation and the suction set up thereby play an important part; and probably the most important factor is the osmotic action in the living cells of the leaf. But no satisfactory explanation of the observed facts has as yet been found.

THE PHLOËM AND FOOD-CONDUCTION. The essential elements of the phloëm are sieve-cells and companion-cells (parenchyma); often bast fibres accompany them. Sieve-cells, like tracheæ, lose their living contents as they mature. The end walls, and often certain areas of the lateral walls, where they abut upon a like cell, become resorbed in spots and perforate. The perforate area is known as a sieve-plate. Through the perforations the contents may pass freely. It has been shown that when the perforations in a membrane amount to less than 1 per cent. of the area, there may pass through it 60 per cent. of the gases and solutes which could do so were the whole area open, provided they are being freely removed from the other side. In life the contents of the sieve is a slime, in which are abundant the various foods, both proteid and carbohydrate. In addition to this evidence as to their function, girdling experiments have shown that when the phloëm bundles are severed the growth of parts beyond is hindered or stopped. Other tissues of the bundles participate in the transfer, but no decisive division of labor can be made out, beyond the fact that the sieve-cells are most efficient.

LATEX-VESSELS. The latex-vessels are irregularly branched tubes (the branches sometimes connected into a network), containing a milky or colored sap called latex (q.v.). They are found in only ten of the large families of plants, both monocotyledons and dicotyledons, in which they are believed to serve for the conduction of foods. The reasons for this are as follows: (1) The latex always contains, among a great variety of substances, foods whose amount varies much from time to time, and these variations seem to be correlated with variations in growth and development. (2) The latex-vessels are developed early among the growing tissues where foods are needed. They have abundant branches in the leaves and special relations to the cells where food is made.

The mode by which the foods are transported in sieve-cells and latex-vessels is not known. The contents are under pressure from the turgor (q.v.) of adjacent living cells. Bending and the consequent mechanical compression would facilitate mixing of the contents. But diffusion movements are probably the main agency.

CONDUCTION OF HEAT. See HEAT.

CONDUCTOR (Lat., leader, from *conducere*, to lead together). In music, the person who directs the chorus or orchestra, or both combined, and who is responsible for the interpretation of the works performed by the artists under his direction. A good conductor must be a thorough musician. He must have had careful training in all branches of musical composition, must be familiar with the compass and peculiarities of the voice and all orchestral instruments; must be a good score-reader, and a man of broad musical culture, familiar with the styles of various epochs and masters. In addition, he must be gifted with poetic temperament, an unusually fine ear, a forceful, magnetic personality that commands instant obedience, and great coolness and presence of mind. That he be also a fine performer on some instrument is not essential; two of the world's greatest conductors, Wagner and Berlioz, were wretched performers. The principal work of the conductor is not done in public during performances, but during rehearsals. His preparation really begins at home. He must make himself thoroughly familiar with the score of the work he is to conduct. This is best done at the pianoforte. He must have a clear idea of the form of the work, of the melos (q.v.), of the different phrases. Before he conducts the first rehearsal, he has decided on the interpretation of the work, and knows exactly what he wishes each performer to do.

The first rehearsal of a new work (especially if performed from manuscript) is largely taken up with correcting mistakes in the parts. Here the conductor's ear must be on the alert. During rehearsal the conductor can convey his instructions to the singers and instrumentalists by means of the spoken word, audible beating of the rhythm, and by singing or playing to them. In choral works the chorus is rehearsed separately with the piano. The soloists also rehearse privately, with the conductor at the piano, before rehearsals with full orchestra begin. In studying instrumental works, like symphonies, a careful conductor often rehearses the strings and wind instruments separately. After the performers have become thoroughly familiar with the conductor's intentions, they are ready to be guided during the public performance by his baton, and by signals given with the hand or eyes. By that time the conductor practically knows the score by heart. It lies before him more for occasional reference than actual reading. People in general know very little about the real responsibility and importance of the conductor. Berlioz does not exaggerate when he says that a poor singer or instrumentalist can ruin only his or her part, but a poor conductor can ruin the whole performance.

While the essential functions of the conductor have been pretty much the same at all times, the manner of conducting has varied greatly. The custom of beating time with a baton can be traced to the remotest antiquity, when oarsmen were directed by such means. When the baton was introduced for beating time in music is not known. An ancient manuscript is preserved in Paris, showing Heinrich von Meissen, a minnesinger, who died in 1318, directing a group of vocal and instrumental performers by means of a baton. We know nothing of the mode of conducting between that time and 1600. The earliest

operatic performances were conducted from the harpsichord. In the recitative, the leader struck the few chords upon the instrument, and in the concerted pieces he led. This he did by nodding the head, stamping the foot, and using one arm or even both arms. When the opera reached France and Germany, this mode of conducting was naturally employed in these countries also. In Italy this method maintained itself up to the first half of the nineteenth century. In Germany we find before 1700 that at performances of sacred works in churches the organist was assisted by a time-beater. This time-beater was not a conductor: he only indicated the time. But shortly after the beginning of the eighteenth century the Italian operatic method was adopted for the church, and the organist was the sole director, as is still the custom in churches to-day. The earlier symphonic works were also conducted from the harpsichord. When the number of wind instruments increased, it was found that the tones of the harpsichord could not be heard by all players, and the time-beater again made his appearance. In this manner Haydn and Mozart conducted their symphonies, they sitting at the harpsichord while some one else beat time. Beethoven conducted with the baton, and the first violin or concert-master assisted.

Interpretative conducting may be said to have begun with Stamitz (1719-61) and his pupil Cannabich (1731-98), whom Mozart called the best conductor he ever heard. Cannabich developed the *crescendo* and *diminuendo* of the orchestra, one of the great means of expression. Gossec (1738-1829) must also be mentioned among the early conductors who developed orchestral techniques. But these men were exceptions at their time. Interpretative conductors as a class did not exist before the beginning of the nineteenth century. Among these the greatest were Spohr, Weber, and Mendelssohn in Germany, and Habeneck, a German by birth and training, in France. With Wagner and Berlioz begins the school of modern conducting, which is the culmination and natural development of the work begun by the four eminent conductors just mentioned. Nearly all the great modern conductors are German. France boasts three great names—Pandeloup, Colonne, and Lamoureux. But among the Germans there are Liszt, Bülow, Richter, Seidl, Mottl, R. Strauss, Weingärtner, Nikisch, Paur, Lohse, Levi, Zumpe, Suher, Thomas. Among the best treatises on conducting are: Wagner, *Ueber das Dirigiren* (vol. viii. of his collected works, Leipzig, 1888); Berlioz, *Treatise on Modern Instrumentation*, translated by Bennett (London, 1882); Henderson, *The Orchestra and Orchestral Music* (New York, 1899).

CONDUCTOR and INSULATOR OF ELECTRICITY. The property of electrical conductivity is possessed in some degree by all known substances. There is, however, an enormous difference between the conductivity of those that are used as conductors and those that are used as insulators, the former having many million times the conductivity of the latter. The substances at the lower end of the scale are therefore of sufficiently low conductivity to serve for covering and supporting wires made of the good conductors, without permitting any serious escape of an electric current when the wires are charged.

In transmitting electricity from point to point, through telegraph or electric-light lines, for example, those substances possessing the greatest conductivity, such as copper and iron, are selected to form a path for the current, and these are surrounded with materials which have the least conductivity or offer the highest resistance, such as air, rubber, and glass, in order to confine the current and compel it to travel to the end of the line. When a conductor is so surrounded or so placed on non-conducting supports that it prevents the electricity communicated to it from passing into the ground or escaping, it is said to be insulated.

As the difference between conductors and insulators is merely one of degree, there is, even under the best conditions, a loss in the transmission of electricity over a line of wire proportionate to the amount of leakage through the insulation and the resistance to travel offered by the wire itself, since the slight effort required of the current to force its way ahead through the wire causes some of it to escape through the insulation in the same way that water forced through a long pipe will escape in small quantities at weak points. It is, indeed, extremely necessary to prevent conductors buried in the earth from having any connection with water or dampness, and, if the insulation of the conductor is defective in a damp spot, a certain proportion of the current will leave the conductor and travel through the earth. Chemically pure water is a non-conductor, but as found in the earth, water is an excellent conductor on account of the materials it holds in solution.

The electrical conductivity, and its reverse, the resistance of materials, are, therefore, subjects of great importance to electricians; and the selection of materials of high conductivity or low resistance for wires, and materials of high resistance for insulators, receives careful attention. The best conductors are gold, copper, silver, aluminum, brass, iron, and all other metals. The best insulators, or the worst conductors, are dry air, glass, mica, porcelain, paraffin, rubber, silk, gutta-percha, and almost all the hydrocarbons. The intermediate substances are many liquids and damp substances, carbons, minerals, and compound substances. The conductivity of all substances is greatly affected by changes of temperature. An increase of temperature increases the resistance of all the metals, while it has the opposite effect in other substances. Glass loses its insulating properties at a red heat, and so do wax, sulphur, amber, and shellac when fused.

Glass, if not the most perfect insulator, far exceeds others in hardness and durability, and is much employed as insulation for light electrical apparatus. Hard rubber or vulcanite enters into the construction of much electrical apparatus on account of its high resistance. Paraffined paper is also employed for condensers (q.v.), while for the armatures of dynamos and motors mica is used. See ELECTRICITY.

CONE (Lat. *conus*, Gk. *κῶνος*, *kōnos*, cone, Skt. *śāna*, whetstone, from *śā*, to sharpen). A solid formed by a plane cutting all of the elements of a conical surface. A conical surface is generated by a line called the generatrix passing through a fixed point and tracing a fixed curve called the directrix. If the line is unlimited it generates two conical surfaces, on opposite sides of the point (vertex), called the nappes of

the cone. A cone whose base is a circle is called a circular cone. If the vertex is on a perpendicular to the base of a circular cone, through its centre, the cone is called a right circular cone. A right circular cone may be generated by rotating a right-angled triangle about one of its perpendicular sides. The line from the vertex to the centre of the base is called the axis. If the axis makes with the base an angle other than 90° , the cone is called oblique. If a plane cuts a cone between the vertex and the base, the cone is said to be truncated; if the cutting plane is parallel to the base, the lower part is called a frustum of the cone, the section made by the cutting plane being called the upper base. Three curves, called conic sections (q.v.), may be formed by planes cutting a right circular cone at various angles to the base.

CONE, IN BOTANY. See CONIFERÆ.

CONE, ORELLO (1835—). An American theologian and author. He was educated at Saint Paul's College, Missouri; was professor at Saint Lawrence University from 1866 to 1890, and again became associated with that university in 1900. He was also for a term of four years president of Buchtel College, Ohio. He was appointed editor of the *International Handbooks of the New Testament*, and published the following works: *Gospel Criticism and Historical Christianity* (1891); *The Gospel and Its Earliest Interpretations* (1893); *Paul, the Man, the Missionary, and the Teacher* (1893); *Rich and Poor in the New Testament* (1902).

CONE, SPENCER HOUGHTON (1785-1855). An American clergyman, born at Princeton, N. J. He studied for two years (1797-99) at Princeton; was at first an instructor in private schools in Burlington, N. J., and Philadelphia, Pa.; and later became an actor, and played in Philadelphia and other cities with success for seven years (1805-12). He accepted a clerical position on the *Baltimore American* in 1812. In 1814, upon his removal to Washington, D. C., to enter upon a Government office, he became a minister of the Baptist Church. In 1815 and 1816 he was chaplain to the House of Representatives, and in 1823 was called to the Oliver Street Baptist Church, New York City. In 1841 he took charge of the Broome Street Church, where he remained during his life. From 1832 to 1841 he was president of the Baptist Triennial Convention for the United States. On the formation of the American Bible Union he was chosen president, and remained such until his death, and from 1837 until 1850 he was president of the American and Foreign Bible Society. He was a pulpit orator of much ability, and one of the foremost clergymen in his denomination.

CONEFISH (so called from its shape). A small, somewhat globular sea-fish (*Monocentris japonicus*) of the family Beryceidæ, dwelling on the coasts of China, Japan, and the Philippines, and called by the Japanese 'matskasa,' or pine-cone fish. See Colored Plate of PHILIPPINE FISHES.

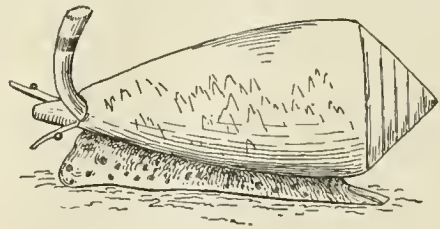
CONEGLIANO, kō'nā-lyā'nō. A city in the Province of Treviso, Northern Italy, situated 35 miles north of Venice (Map: Italy, G 2). It is commanded by a huge castle, and has a cathedral containing a fine altar-piece by Cima (1492), a native of Conegliano. In the Loggia Municipale are monuments to Dante, Victor Emmanuel, Gari-

baldi, and the victims of the War of Liberation. The town is noted for its wine. In 1808 Marshal Monecy was named Duke of Conegliano by Napoleon. Population (commune), in 1881, 8938; in 1901, 9796.

CONENOSE, or KISSING BUG. A bug of the predatory family Reduviidæ; specifically *Conorhinus sanguisuga*, called 'giant bedbug' in the southern United States, where it is a pest in houses. It is three-quarters of an inch long, black with red patches, or spots, on the sides of the thorax, at the base and apex of the wing-covers, and bands on the sides of the abdomen. The young much resemble large bedbugs (to which they are allied), and all ages are fierce biters and blood-suckers, preying upon insects and flying into houses at night and attacking sleeping persons and animals. The kissing bug seems to breed in the nests of mice, and is prevalent from the central Mississippi Valley to the tropics. The name 'assassin bug' has been given to the whole family by Comstock, because of their cannibalism and rapacity; and to certain species, especially *Melanolestes picipes* and *Reduvius personatus*, which were especially abundant in the Eastern States during the summer of 1898, was due the 'kissing-bug' excitement, busily fostered by the newspapers. Of the two 'kissing bugs' above mentioned, the latter, according to Howard, is a cosmopolitan form which, in the Northern States, is found in basements and cellars of dirty houses, and preys upon bedbugs and cockroaches. When immature it covers itself with dust and presents a very odd appearance. The 'thread-legged' bugs of the family Emesidæ, which rob spiders of their prey, are near relatives.

CONEPATE, kō'nē-pāt (Nahuatl *ncpatla*, subterranean dwelling). The name in Mexico of the large white-backed skunk (*Concpatus mapurito*), called in South America 'mapurito.' See SKUNK.

CONE-SHELL. The popular name of a genus (*Conus*) and family (Coniidae) of gastropod mollusks, of the order Streptoneura; having a shell of remarkably regular conical form; the spire on the base of the cone, and sometimes rising from it to a sharp point, sometimes almost flat; the aperture narrow and straight, without protuberance or fold, extending from the base of the cone to its apex. The head of the animal has a proboscis capable of much extension; the mantle is scanty and narrow, forming an elongated siphon in front; the shell is covered with an epidermis. These mollusks are carnivorous; they inhabit



A CONE WALKING TOWARD THE LEFT.

The siphon is protruded and held upright; and the eyes are seen on the tentacular eye-stalks springing from the head.

shores and banks of sandy mud, chiefly within the tropics, a few only occurring in the Mediterranean. The shells of many species are very

beautiful, and much prized by collectors. Cone-shells first appear in Cretaceous rocks, and become more abundant in later formations.

The young cone-shells are elongated and have high spires, which in the adults are more or less completely shortened through envelopment by the outer whorls. These elongated spires are also characteristic of the adult stages of the early ancestors of the cones, of Cretaceous and Tertiary time, especially of the genus *Conorbis*, of the Eocene. The genus *Conus* has some doubtful representatives in the Cretaceous, about 150 species in the Tertiary, in the rocks of which age it is common and beautifully preserved, and it is at present approaching the maximum of its evolution. See Colored Plates of MARINE GASTROPODS.

CONES' SI BARK. See WRIGITIA.

CON'ESTO'GA (Iroquois). Formerly an important tribe of the Iroquoian stock, occupying the country on the Lower Susquehanna and about the head of Chesapeake Bay in Pennsylvania and Maryland, and claiming dominion over several smaller tribes on both sides of the bay. The name is said to mean 'people of the forked roof-poles.' The French called them *Andastes*, while to the Virginia tribes and the Southern colonists they were known as *Susquehannas*. They lived in palisaded villages, and when first known were a powerful people, bidding defiance to the invading Iroquois, by whom, however, they were at last overcome about 1675. A part fled south through Virginia and took refuge in North Carolina, under the name of *Meherrin* (q.v.). Others were deported to the Iroquois country, whence they were afterwards allowed to return, and settled at *Conestoga*, near Lancaster, Pa. Here they rapidly wasted away, until 1763, when the few that remained were massacred by a mob during the excitement provoked by the Indian wars.

CO'NEY (OF. *canin*, Lat. *cuniculus*, Gk. *κύνικλος*, *koniklos*, or *κύνικλος*, *kyniklos*, rabbit; of Iberian origin). The old English name for the rabbit, used in the Bible as the translation of the Hebrew word *shaphen*, the local name for the Syrian hyrax, or daman (see *HYRAX*), and since applied to other mammals which superficially resemble either *Lepus* or *Hyrax*. The *Pika* (q.v.) is known to hunters and miners in the western United States as the 'coney,' though it looks more like a guinea-pig than a rabbit. In Jamaica the hutia (q.v.) is generally called the 'Indian coney.'

CONEY ISLAND. An island, included in the Borough of Brooklyn, New York City, and the most popular seaside resort in the vicinity of the metropolis; situated on the southern shore of Long Island, 9 miles southeast of the Battery (Map: Greater New York, G 12). Coney Island is nearly five miles long, and from a few hundred feet to three-fourths of a mile wide, and is separated from the mainland by a narrow tidal inlet. For a long period it was considered comparatively worthless; but as soon as its fine beach became recognized as a safe place for bathing, and regular communication by boat and railroad was established, the sporadic bath-houses and cheap hotels were replaced by more permanent structures, and its growth has been extraordinary. It is now reached by several lines of steamboats, and by numerous electric and steam railroads. There are several sharply differentiated districts. West Brighton is the centre for the mass of visitors

and for the cheaper amusements, and is more generally known as 'Coney Island.' To the east is Brighton, the site of a popular race-track. Sea Gate, at the extreme west, and Manhattan Beach, east of Brighton, are more select resorts.

CONFARREATION (Lat. *confarreatio*, from *confarreato*, to marry by an offering of spelt, from *com-*, together + *farreus*, made of spelt, from *far*, spelt; connected with OCh. Slav. *bŕrŭ*, AS. *bere*, Engl. *barley*). A form of celebrating marriage, of peculiar solemnity and of great antiquity, among the Romans. It was a customary form, originally restricted by law to the patricians, among whom it originated. It retained its superior sanctity and validity long after it had been extended to the plebeians, and after simpler and less conventional forms of marriage had come to be recognized. Its specialty consisted in the employment of certain words in the presence of witnesses, and in the performance of a religious ceremony in which *panis farreus* (bread made of spelt) was used. Many of the high offices of State, especially such as were of a priestly character, were open only to those who were born of parents thus married. See *MARRIAGE*.

CONFECTIONERY (from ML. *confectionarius*, confectioner, from Lat. *confectio*, preparation, from *conficere*, to make up, from *com-*, together + *facere*, to make). Preparations of sugar, or of material of which sugar is the principal ingredient, used as sweetmeats.

Where confectionery is pure its use may involve little danger to health. Unfortunately, a certain proportion of the cheaper kinds are adulterated and colored with poisonous ingredients. The common adulterants used are terra alba, kaolin, and other mineral substances intended to give weight and volume to the mass. Most organic coloring materials are harmless, but mineral colors should never be used.

Until the beginning of the nineteenth century the art of making sweetmeats was practiced chiefly by physicians and apothecaries, who used sugar and honey to conceal the taste of their medicines. Medicated candies are still largely made by drug manufacturers. During the earlier half of the nineteenth century the art of candy-making was largely an English specialty. In 1851 an international exhibition was held in London, and the unique collection of candies there exhibited attracted to this industry the attention of other nations, especially Germany and France. The latter soon excelled all other countries in the art of making chocolate bonbons, and still maintains its supremacy. In the United States, as early as 1816, there were twenty candy factories in the city of Philadelphia, and probably as many more in New York. Previous to 1845 each candy dealer made his own goods by hand, the assortment being limited to stick and molasses candy and sugar plums, and a few imported fancy candies. In 1845 the first machinery, in the form of a revolving steam-pan, was introduced by Sebastian Chauveau, of Philadelphia, and the following year a lozenge-making machine was invented by Oliver Chase, of Boston, and put into operation in his candy factory. Since that time new forms of machinery have constantly been added to such an extent that the manufacture of candy forms a separate and important industry.

The following table, taken from a chapter on the confectionery trade, by A. F. Hayward, in the work entitled *One Hundred Years of American Commerce* (New York, 1895), shows the growth of the confectionery industry in the United States as represented by the large factories. In addition, an enormous amount of candy is made every year by small establishments from which statistics are not obtainable.

day the convention of Alabama made the proposition more specific by inviting the other Southern States to send delegates to a convention to be held at Montgomery, Ala., on February 4, in order that they might consult "as to the most effectual mode of securing concerted and harmonious action in whatever measures may be deemed most desirable for the common peace and security." Similar action was taken by the con-

STATISTICS OF THE CONFECTIONERY INDUSTRY IN THE UNITED STATES

YEAR	No. of factories	Hands employed	Capital invested	Wages paid	Value of material used	Value of product	Exports
1850.....	383	1,733	\$1,035,551	\$458,904	\$1,691,824	\$3,040,671	.....
1860.....	541	2,340	1,568,748	668,423	2,991,186	5,361,100	.....
1870.....	941	5,825	4,995,293	2,091,826	8,703,560	15,922,643	.....
1880.....	1,450	9,801	8,486,874	3,242,852	17,125,775	25,637,033	\$73,253
1890.....	2,921	27,212	23,326,790	11,633,448	31,116,629	55,997,101	179,276

In 1884 the National Confectioners' Association of the United States was organized. It includes all the leading manufacturers of the country; and one of its purposes, as defined by its constitution, is "to advance the standard of confectionery in all practicable ways and absolutely to prevent harmful adulterations." The association has secured the necessary legislation in the different States whereby the manufacture or sale of any candy containing harmful ingredients or poisonous colors is punishable by law.

CONFEDERACY, THE. A comedy by Vanbrugh (1705), said to have been adapted from Dancourt's *Bourgeois à la mode*.

CONFEDERACY, UNITED DAUGHTERS OF THE. A woman's patriotic society organized in Nashville, Tenn., in 1894, for the preservation of the memory of Southern devotion and suffering during the Civil War. The society admits to membership the direct female relatives and lineal female descendants of those who served honorably in the Confederate service, or who in some other direct way aided the Confederacy. The organization is subdivided into local chapters, of which there are over 550 in the Southern States and elsewhere. These are governed by State divisions, which in turn are controlled by a general organization. Annual reunions are held, usually in November, and the total membership is nearly 30,000.

CONFEDERATE STATES OF AMERICA. The name adopted by the federation of those eleven commonwealths of the United States of America which seceded from the Union in 1861, and were arrayed against the national Government during the Civil War (q.v.). None of the theories of 'State sovereignty' was inconsistent with membership in a properly federated union, and even the extreme advocates of those views recognized the advantages of the essential features of the existing system of national government. Thus, the convention of South Carolina, at the time of the adoption of its ordinance of secession, December 20, 1860, expressed a strong desire for the early formation of a new confederation by the States at that time contemplating secession. Three weeks later the convention of Mississippi, at a time, as Davis wrote, "when the last hope of preserving the Union of the Constitution was extinguished," indorsed this proposal, as did also the convention of Florida on January 10th. On the following

vention of Georgia, on January 19, and by that of Louisiana, on January 25, with the result that at Montgomery on the appointed day there gathered delegates from these six States, who organized as a Provisional Congress of the Confederacy. By this body for one year, and thereafter by the more representative bicameral body which succeeded it, were directed the affairs of the new confederation, these bodies undertaking quite as complete an exercise of the more essential functions of a national government as had hitherto been undertaken by the old national Congress. Technical objections were dispelled by the exigencies of the situation, and the Congress was recognized as actually possessing, and as entitled to exercise, the powers of general government throughout the States then and thereafter represented in its membership. The authority and influence thus acquired was enhanced by the presence in its sessions not only of many men who had rendered efficient service in a similar capacity at Washington, but also of men who were at the time recognized as leaders of Southern thought and action, such as Wigfall of Texas, ex-President Tyler, Roger A. Pryor, and James M. Mason, of Virginia; Rhett and Barnwell, of South Carolina; Campbell, of Mississippi; Toombs, Cobb, and Stephens, of Georgia; and McRae and Curry, of Alabama. In the first instance, the Congress, as originally organized, was particularly a constituent body, and among its first acts was the adoption, on February 8, in behalf of the six States represented, of a temporary constitution of government, to have force for "one year from the inauguration of the President, or until a permanent constitution or confederation between the said States shall be put in operation, whichever shall first occur." The convention, however, went further and assumed to act as the legislative body of this new government, on the following day enacting that all laws of the United States in force in the Confederate States on November 1, 1860, and not inconsistent with the constitution of the Confederacy, should be continued in force until repealed or altered by the Confederate Congress. To the same end, provision was made for the continuance in office, at least for a time, of all administrative officials, and in order to hasten the detailed organization of the new national government, the more important Congressional committees, upon war, finance, and foreign affairs, were forthwith ap-

pointed. The Provisional Congress furthermore assumed the function of naming the chief executive officers, and on February 9th chose as Provisional President of the Confederacy, Jefferson Davis (q.v.), of Mississippi, and as Provisional Vice-President, Alexander H. Stephens (q.v.), of Georgia. Mr. Davis had already been appointed to the chief command of the Mississippi troops, and although seeming strongly to prefer the military service, he relinquished his plans and undertook promptly the duties of the civil office which had come to him thus unsolicited, and in which he was to become recognized as the leader of the Confederacy. His first important act as President, the choice of a cabinet, was controlled rather unduly by political and geographical considerations. Each of the States represented, except that which secured the Presidency, was allotted a cabinet officer, as was also Texas, which at that time was practically, although not formally, in the control of the secessionists. The result was a group of high officials among whom only two were recognized as men of especial ability—the noted Robert Toombs (q.v.), of Georgia, who became Secretary of State, and Judah P. Benjamin (q.v.), of Louisiana, a man of considerable repute as a barrister, who became Attorney-General. The executive departments were promptly organized, although the activity of some, particularly that of the Navy, soon became limited, and the administration of public affairs proceeded thenceforth along lines familiar to Americans, and without unusual incident except such as naturally arose from the instability of the Government, from the gradual overshadowing of the civil branches of Government by the military, and from its final collapse.

The formal inauguration of Mr. Davis as President occurred on February 18, when, in the course of his inaugural address, he said: "We have entered upon the career of independence, and it must be inflexibly pursued. Through many years of controversy with our late associates of the Northern States we have vainly endeavored to secure tranquillity and obtain respect for the rights to which we were entitled. As a necessity, not a choice, we have resorted to the remedy of separation, and henceforth our energies must be directed to the conduct of our own affairs, and the perpetuity of the Confederacy which we have formed. . . . With a constitution differing only from that of our fathers in so far as it is explanatory of their well-known intent, freed from sectional conflicts, which have interfered with the pursuit of the general welfare, it is not unreasonable to expect that States from which we have recently parted may seek to unite their fortunes to ours under the government which we have instituted. For this your constitution makes adequate provision; but beyond this, if I mistake not the judgment and will of the people, a reunion with the States from which we have separated is neither practicable nor desirable." The constitution of which President Davis thus spoke was intended only for temporary use, and the convention accordingly, on March 11, 1861, adopted and submitted to the various States for ratification, the permanent Constitution of the Confederate States. In large measure this instrument was identical with the Constitution of the United States, although between the two there were

natural divergences of theory, as well as some differences of detail. Thus, the President was made ineligible for reelection, and his term was fixed at six years; a qualified membership in Congress of Cabinet officers was made possible; special prohibitive duties were forbidden, ordinary appropriations were made dependent upon a two-thirds vote in each House; and the President was empowered to veto specific portions of an appropriation bill, while approving other portions. Where opportunity offered, the phrases of the new constitution were so turned as to express the views of the Southern leaders as to sovereignty and as to the proper position of commonwealths in any union or federation. Thus it was specifically stated that each State was "acting in its sovereign and independent character"; that legislative powers were 'delegated' thereby, rather than 'granted,' and that citizens of one State might 'sojourn' in another State with their slaves without losing any right of property therein. The new constitution was, as the New York *Herald* then said, "the Constitution of the United States with various modifications and some very important and most desirable improvements."

The Provisional Congress also made provision for the formation of a permanent army of the Confederacy, proceeded early to establish various sources of public revenue, and promptly attempted to secure from foreign governments both material assistance and formal recognition. The character and work of the army thus organized formed possibly the most distinctive feature in the work of the Confederacy. (See CIVIL WAR.) The development of a system of public finance was hampered by the prevalent opposition to internal taxes, while the small quantities of dutiable goods imported made the customs duties an inappreciable element in the public revenue. To meet this exigency, special war taxes were levied, repeated issues of treasury notes were made, and very large amounts of bonds were authorized by the new government. Produce loans also were resorted to, and subsidies or loans to the central government were made by some of the States, so that the first year was passed with a semblance of financial stability. With the increase of the bond issues, and especially with the abnormal expansion of the currency, prices were forced upward, credit became unsettled, and financial demoralization became pronounced toward the close of the war, when the price of a gold dollar was sixty times its price at the beginning of the war, when boots sold at \$200 a pair, and when the price of coffee had increased nearly two hundred times, and the price of cereals nearly ninety times. In seeking to enlist the aid of foreign governments, the steps taken by the Confederacy early gave occasion for critical relations between England and the United States (see TRENT AFFAIR), and led also to serious diplomatic complications in the later years (see ALABAMA CLAIMS), although the efforts of this character were to a considerable degree successful and at times reached such a point as to foreshadow foreign intervention, or at least recognition to an extent that would have made the success of the Confederacy, if not imminent, certainly far less improbable.

The early months of the Confederacy were marked, in addition to the rapid steps of organi-

zation and of preparation for conflict, by an effort at peaceable adjustment. In response to a call of the Virginia Legislature, a peace convention met at Washington in February, 1861, and delegates from seven slave-holding States, including Tyler and Rives of Virginia, Caruthers of Tennessee, and Clay of Kentucky, took part in its futile proceedings. During the following month there were active at Washington three formally appointed commissioners of the Confederate Congress—Messrs. Crawford of Georgia, Forsyth of Alabama, and Roman of Louisiana—who endeavored, largely through the mediation of Justice Campbell of the Supreme Court, to secure recognition and to arrange some reasonable basis of at least a temporary settlement, pending more formal negotiations. This effort also proved abortive through a misunderstanding, involving charges of breach of faith, as to the relief of Fort Sumter. With the withdrawal of these commissioners from Washington and the disappearance of any possibility of voluntary recognition by the Northern Government, the position of the Confederacy was more clearly defined. Its strength, moreover, was increased by the secession of Virginia on April 17, of North Carolina on May 20, and of Tennessee on June 8, so that there were eleven States in the new union when its Congress met for its third session on July 20, at the new capital of the Confederacy, Richmond, Va. Upon the 6th of November were held the first general elections under the permanent constitution, resulting in the choice by a unanimous electoral vote of Davis as President, and Stephens as Vice-President. The fourth and last session of the Provisional Congress closed on February 18, 1862, when the new Senate and House assembled, including in their membership such men as Clay and Yancey of Alabama, Hunter of Virginia, and Wigfall of Texas. Upon the 22d Davis was formally inaugurated as President for a term of six years, but the remaining years of his service were distinguished not so much by his administrative services as by the conflict between the civil and military elements, and by such controversies as that over the suspension of the writ of habeas corpus, the whole situation gradually becoming more and more abnormal, and being to some extent typified by the studied omission to provide for the creation of a supreme court. The course of the President in his official career provoked at the time much severe criticism, and later occasioned a variety of comment. Of his election one recent writer says that "the choice was the best that could have been made," while another equally competent critic describes the situation as follows: "The strongest and most self-assertive spirit of the senatorial clique, having been chosen President, at once began to quarrel with his associates, and to drive them from his counsels; there was no popular strength in the Provisional Congress to resist him; and even before the inauguration of the permanent government, the Confederacy had become a military despotism of the executive." Such a tendency was increased by the custom of holding secret sessions of Congress and by the practice of Cabinet officers exercising their right to sit in Congress, as well as by the gradual lowering of the political morale and independence of that body. This unfortunate condition of affairs was further complicated

by personal controversies among officials, both civil and military, in the highest stations, so that the later months of the administration of the Confederacy were such as to indicate the approach either of internal crisis or of complete dissolution, and such as to make the collapse of the Government, on the fall of its capital, a natural and inevitable event. The first Congress under the permanent constitution had held four sessions, and the second Congress had held two sessions, the final adjournment of the body having been taken on March 18, 1865. The Cabinet officials who served the Confederacy were as follows: Secretary of State, Robert Toombs, of Georgia, February 21, 1861; R. M. T. Hunter, of Virginia, July 30, 1861; Judah P. Benjamin, of Louisiana, February 7, 1862. Secretary of the Treasury, Charles G. Memminger, of South Carolina, February 21, 1861; George A. Trenholm, of South Carolina, June 13, 1864. Secretary of War, L. P. Walker, of Alabama, February 21, 1861; Judah P. Benjamin, of Louisiana, November 10, 1861; G. W. Randolph, of Virginia, March 17, 1862; James A. Seddon, of Virginia, March 22, 1862; John C. Breckenridge, of Kentucky, February 15, 1865. Secretary of the Navy, Stephen R. Mallory, of Florida, March 4, 1861. Attorney-general, Judah P. Benjamin, of Louisiana, February 21, 1861; Thomas H. Watts, of Alabama, September 10, 1861; George Davis of North Carolina, November 10, 1863. Postmaster-General, John H. Reagan, of Texas, March 6, 1861.

While the political organization of the Southern Confederacy was thus almost identical with that prevailing at the North, the outbreak of the war served to accentuate in important respects the marked difference between the two sections, particularly in those features which were of especial importance in time of war. Not only did the population of the Union States exceed that of the seceding States in the proportion of five to two, but the discrepancy was even greater in material resources. In general wealth, in foreign commerce, in internal improvements, and in manufactures, especially of fabrics and of *materiel* of war, the North was vastly superior to the South. Thus, the value of the improved lands of the seceding States was estimated at less than two billion dollars, while the value of those in the Union States was nearly five billion dollars. In the South were 150 fabric factories, with a product valued at eight million dollars, while in the North there were 900 such factories, with a product valued at one hundred and fifteen million dollars. In the South some two thousand persons were employed in the manufacture of clothing, while in the North one hundred thousand persons were so engaged. During the year 1860 the imports of the South were valued at \$31,000,000, and those of the North at \$331,000,000. It was thus apparent that the South was "dependent on Europe and on the North for everything but bread and meat." The South, indeed, seemed fairly supplied with foodstuffs, but the mismanagement seems to have been such that at the end of 1864 there was a "general distress for food," and "an actual prospect," as a leading Southerner stated it, "of starving the Confederacy into submission." In addition to these serious obstacles to success, the South was seriously embarrassed by the lack of powder-mills and of suitable iron-works. Only one plant, the Tredegar Iron-

Works at Richmond, was capable of turning out the larger types of field guns, and it was not until the close of the war that operations were well under way for equipping the South with suitable ammunition and arms plants. Moreover, such minor supplies as leather were very limited and at times quite unavailable, and throughout all branches of activity were apparent the very unusual difficulties under which the Confederacy was obliged to carry on its work of administration and of warfare. The conditions prevailing at the end of such a struggle, and the results of the termination of such a conflict appeared more tangibly in the following years of Reconstruction, when the energies of the defeated were directed toward the economic reorganization of the South as well as to its political reorganization. See also SLAVERY and RECONSTRUCTION, and the articles on the various States mentioned.

BIBLIOGRAPHY. Important works by Southerners are: J. Davis, *Rise and Fall of the Confederate Government* (2 vols., New York, 1881); A. H. Stephens, *Constitutional View of the War Between the States* (2 vols., Philadelphia, 1870); and the several works of E. A. Pollard, especially his *Lost Cause* (New York, 1867). There is a short bibliography in A. B. Hart, *Guide to American History*, sec. 209 (Boston, 1899), and a paper, "Materials for the History of the Government of the Southern Confederacy," in the *American Historical Society Papers* (New York, 1890). A recent and valuable work on financial and industrial matters, by J. C. Schwab, is *The Confederate States of America* (New York, 1901). Consult also Callahan, *Diplomatic History of the Southern Confederacy* (Baltimore, 1901).

CONFEDERATE VETERANS, UNITED. A patriotic society organized in New Orleans, La., in 1889. The objects of the society are to unite in a general federation all associations of Confederate veterans now in existence or hereafter to be formed; to gather authentic data for an impartial history of the war between the States; to preserve relics and mementos; to cherish the ties of friendship formed during the war; to aid veterans and their widows and orphans; and to keep alive the memory of the dead. Membership is extended to all surviving soldiers or sailors of the Confederate service. The local organizations, which are called camps, are nearly 1500 in number, and are organized in three departments, as follows: The Army of Northern Virginia Department; the Army of Tennessee Department; and the Trans-Mississippi Department. The badge or recognition button, worn in the lapel of the coat, is a square miniature Confederate flag. Membership is estimated to be upward of 65,000. The *Confederate Veteran*, Nashville, Tenn., is the official organ of the association.

CONFEDERATE VETERANS, UNITED SONS OF. A patriotic society organized in Richmond, Va., in 1896. The objects of the society are to gather authentic data for a history of the Civil War, written from a Southern standpoint; to collect historic relics; and to establish an accurate record, so far as may be, of the services of every Confederate veteran. Membership is accorded to the male descendants of Confederate veterans with an honorable military record. The society is organized into camps, dis-

tributed throughout the Southern States, and comprising three departments, as follows: Army of Northern Virginia Department; Army of Tennessee Department; Trans-Mississippi Department. Annual reunions are held, at which the representatives of local camps meet, forming the general society of the organization. The total membership is estimated to be about 10,000. In 1902 this society purchased Beauvoir, the home of Jefferson Davis, and it will be used as a home for Confederate veterans.

CONFEDERATION (Lat. *confederatio*, from *confederare*, to unite in a league, from *com-*, together + *federare*, to make a league, from *fadus*, league; connected with Lat. *fides*, faith, from *fidere*, to believe, Gk. *πειθειν*, *peithein*, to persuade, Got. *bidjan*, O.H.G. *bittan*, Ger. *bitten*, to request, AS. *biddan*, Engl. *bid*). An alliance of nations, States, or princes; according to Woolsey (*Introduction to International Law*, sec. 104), a union more or less complete of two or more States which before were independent. The New England Confederation (1643-84) is the earliest example of confederation in America. In 1777 the Continental Congress adopted the Articles of Confederation, in which are set forth the principles of government which were a few years later embodied in the Constitution of the United States, with such additions as were necessary "in order to form a more perfect union." Most of the Latin-American republics have come into being on a basis of confederation. In 1815 the German Confederation was formed, to replace the Holy Roman Empire, which confederation had been dissolved in 1806. The North German Confederation (1866-70) preceded the establishment of the German Empire, by whose original Constitution all the States of Germany "form an eternal union for the protection of the realm and the care of the welfare of the German people." The Swiss Confederation, comprising at present twenty-two autonomous cantons, had its origin in 1291 in the union of the cantons of Uri, Schwyz, and Lower Unterwalden.

CONFEDERATION, ARTICLES OF. See UNITED STATES.

CONFEDERATION, GERMAN. See GERMANY.

CONFEDERATION OF THE RHINE. A league of German princes formed in 1806 under the protection of Napoleon. The first to seek the French alliance were the Electors of Bavaria and Württemberg, who, in recompense for their services, were elevated to the dignity of kings by the Peace of Presburg, December 26, 1805. At Paris on July 12, 1806, sixteen German princes formally signed an act of confederation, dissolving their connection with the German Empire, and allying themselves with France. These princes were the kings of Bavaria and Württemberg, the Arch-Chancellor Dalberg, the Elector of Baden, the Duke of Cleves and Berg (Joachim Murat), the Landgrave of Hesse-Darmstadt, the princes of Nassau-Usingen, Nassau-Weilburg, Hohenzollern-Hechingen, Hohenzollern-Sigmaringen, Salm-Salm and Salm-Kyrburg, the Duke of Arenberg, the princes of Isenburg-Birstein and Liechtenstein, and the Count of Leyen. The princes justified their conduct by enumerating the vices of the constitution of the German Empire, promised to aid Napoleon in his wars with an army of 63,000 men, and called upon the other princes of

Germany to imitate their example. The Arch-Chancellor Dalberg was made Prince Primate of the Confederation, with his seat at Frankfort. During the years 1806-08 other German sovereigns enrolled themselves as members of the Confederation, and at the close of 1808 it embraced a territory of 122,236 square miles, contained a population of 14,608,877 souls, and kept up an army of 119,180 men. The disasters which overtook the French army in the Russian campaign acted like a solvent on the Confederation, and it vanished in 1813 in the sudden outburst of German patriotism. Consult: Rambaud, *La domination française en Allemagne, 1804-11* (Paris, 1876); Seeley, *Life of Stein* (3 vols., Cambridge, 1878); and the general histories of Ranke, Pertz, Oncken, and Treitschke. See GERMANY.

CONFERENCE (ML. *conferentia*, from Lat. *conferre*, to carry together, from *com-*, together + *ferre*, to bear). The assemblage of persons gathered for the purposes of consulting upon any course. In legislation there are often conference committees appointed when the two houses of a legislature disagree on any measure. The two houses may meet in joint session for certain specified purposes, but never in conference. There have been many international conferences, such as those of Geneva in 1864, of London in 1864, 1867, and 1871, and that of The Hague, 1899. An ecclesiastical conference was held at Hampton Court Palace, at the instance of James I., in 1604. It was composed of prelates of the Church of England and dissenting ministers, the object being to establish a scheme of 'comprehension' or common creed. This conference led to the translation of the Bible known to English readers as the Authorized Version. Another conference was held in 1661, the Savoy House Conference, when some alterations were made in the Prayer Book. Similar conferences were once frequent in the Roman Catholic Church; and in other churches there are pastoral and other conferences. The annual meeting of the Wesleyan Church of England is called the Annual Conference; and the title is used for annual or other stated sessions in the Methodist Episcopal, the Evangelical, and some Baptist denominations. Under the name of 'Evangelical Church Conference,' delegates from the Reformed churches in the German States and Austria meet for the consideration of questions affecting church matters.

CONFERVA (Lat., a kind of water-plant, from *confervere*, heat, from *com-*, together + *fervere*, to be hot). A general term sometimes applied to certain simple filamentous green algae. Also the name of a genus of the Chlorophyceæ (q.v.).

CONFES'SIO AMAN'TIS (Lat., the lover's confession). A long poem of over 30,000 lines by John Gower (1393). It is a conversation between Genius, the representative of Venus, and a lover, in which a series of tales, illustrating the effects of the various vices, is introduced.

CONFESSION (Lat. *confessio*, from *confiteri*, to confess, from *com-*, together + *fateri*, to acknowledge; connected with *fari*, Gr. *φῆναι*, *phēnai*, to speak). In law, a purely voluntary declaration made by one who has committed a misdemeanor or a crime, to some other person, of the agency or participation which he had in the offense. Also, the admission of a prisoner that he is guilty of the offense with which he is

charged. If made before a magistrate or in the course of judicial proceedings before a court, such confessions are 'judicial'; if made anywhere else, they are 'extra-judicial.' An entirely voluntary confession is admissible in evidence; but not so if procured through inducements, threats, promises, or hope of escape or favor. A confession in answer to questions by a magistrate or by any other person is admissible. A prisoner's confession when the *corpus delicti* (q.v.) is not otherwise proved is not sufficient to warrant conviction. Whether an alleged confession is admissible, as having been made voluntarily, for example, is a question for the court; what weight as evidence it is entitled to is a question for the jury. See ADMISSION; also CRIMINAL LAW, and consult the authorities referred to there.

CONFESSION. In Roman Catholic theology, a declaration of sins to a priest in order to obtain absolution. The practice of confession is believed by Roman Catholics to be of divine institution, being founded on the power of binding and loosing from sin conferred on the Apostles by Christ (Matt. xvi. 19, xviii. 18, and John xx. 22, 23). The power of binding or loosing, being in the view of its advocates judicial and discretionary, presupposes a confession of sins in order to its being judicially exercised. Catholics do not allege any formal scriptural precept for it, but they contend that the above passages contain an implied precept. Though the Apostle James recommends that Christians should confess their 'faults one to another,' yet open and public confession appears to have been first required in cases where persons guilty of gross apostasy desired to be again received into the Church. Motives of piety, and a wish to avoid the scandal of open confession, led gradually to the preference of private confession. Open or public confession, which was part of the discipline of public penance, ceased when that discipline went into disuse. Private confession has been retained, and though its defenders hold it to have been at all times in use, a general law was enacted by the fourth council of the Lateran in 1215 (can. xxi., *omnis utriusque sexus*) requiring that every Christian who has attained the years of discretion should confess to a priest approved for the purpose, at least once in the year. Confession is one of the three 'acts of the penitent'—contrition, confession, and satisfaction—which the Council of Trent declares to be parts of the sacrament of penance. The sinner is required to confess each and every mortal sin, in thought, word, and deed, which, after diligent examination of his conscience, has occurred to his memory. To conceal one vitiates the confession. He is exhorted, but not required, also to confess venial sins (q.v.), especially if they be habitual. Confession, in order to be fruitful, must be accompanied by contrition and a purpose of amendment. It commonly embraces the sins committed since the last confession; but may include a longer period, and even the entire life. In the latter case, the confession is called general. It is called 'auricular,' as being made to the private 'ear' of the priest, and is ordinarily spoken; but in cases of necessity may be made in writing, by signs, or even by an interpreter. Priests cannot validly receive confessions in any place without the 'approbation' of the

bishop of the place, which may be given either absolutely or with restrictions. Confession is prescribed in the ritual of the Greek, the Russo-Greek, the Coptic, the Syrian, and the other Oriental churches. In most of these churches the practice is obligatory, but in some it has gone into disuse. The Lutheran Church professes (according to the eleventh article of the Augsburg Confession) "that private confession must be retained in the Church; but that full and particular statement of *all* sins is not necessary, because, according to Psa. xix. 12, it is impossible." In the Apology of the Augsburg Confession, it is said to be 'impious' to abolish the practice of private confession to the priest; but in practice the Lutheran Church has widely departed from these rules. The Reformed Church in Germany has always been more inclined to general confession, and the United Church also substitutes for private confession certain devotional exercises previous to communion. The Church of England employs a general form of confession and absolution in its morning and evening services, but retains private confession in the rubric for visitation of the sick (the last not retained by the Protestant Episcopal Church in the United States). See ABSOLUTION; PENANCE; CONTRITION.

The *sigillum confessionis* ('seal of confession'), in the Roman Catholic and in the German Protestant Church, means the obligation of a confessor or priest not to divulge the secrets of the confessional. This custom of secrecy is traceable in the fourth and fifth centuries, but was made binding by Innocent III. (1198-1216), and its violation by a priest makes him subject to the severest penalties that can be inflicted by the Church. See PRIVILEGED COMMUNICATION.

CONFESSION (the tomb of a confessor or martyr). In church architecture, the recess, ambulatory, or chapel beneath the central altar, containing the relics of the saints, and corresponding to the subterranean tombs of the martyrs in the catacombs over which churches were erected. Such confessions gradually grew in size between the fourth and seventh centuries, until they developed into the crypt (q.v.).

CONFESSIOAL (ML. *confessionalis*, relating to confession, from Lat. *confessio*, confession). The seat, recess, or booth in which the priest sits to hear confession in a Roman Catholic church. These booths are distributed throughout the interiors of churches, in the nave and aisles, and are slight closed structures made of wood. The confessional commonly has a door in front, through which the priest enters, and an opening on one or both sides, like a small window, with a grating of wire or zinc, for the penitents to speak through as they kneel.

CONFESSION AND AVOIDANCE. Pleadings are said to be in confession and avoidance, in common-law practice, when they expressly or by a reasonable implication admit the allegations of the pleading to which they are interposed, and show some justification or excuse which will deprive them of the legal effect of supporting the plaintiff's claim of a right to recover. The admission must be sufficiently comprehensive to give color to the matter adversely alleged—that is, must show it to be *prima facie*, or apparently, true. Any pleading after the declaration may be by way of confes-

sion and avoidance of the last pleading of the opposite party. Thus, if the defendant should plead a release by plaintiff, the latter might in his replication admit that he gave a release, but allege that it was obtained from him by coercion or fraud. This might be denied by the opposite party, and then the cause would be at issue. See PLEADING.

CONFESSION D'UN ENFANT DU SIÈCLE, kŏn'fe-syŏn' du nän'fän' du syŏk'l, LA (Fr., the confession of a child of the century). A work of fiction by Alfred de Musset (1836), founded upon the author's love affair with George Sand.

CONFESSION OF JUDGMENT. A method of allowing judgment to be entered against a person upon his acknowledgment in proper form that a claim is, or is about to become, due and owing to another, and consenting that the latter may enter judgment for the amount named. A judgment thus obtained is equally valid and binding as though it had been secured by legal process. While the weight of advantage is with the person obtaining the judgment, in the saving of the time and expense of litigation, this device may also be of advantage to the debtor in saving him the annoyance and costs of suit involved in the ordinary process. It is commonly resorted to in cases where the debtor desires to prefer a certain creditor and give him the priority over other creditors and the additional security which a judgment affords.

It differs from *cognovit* (q.v.) in the fact that it may be made without the institution of an action, and in the further fact that it is generally limited to debts, in the usual sense of that term, and is not available for the liquidation of claims founded on torts. However, as intimated above, a confession of judgment may be equally valid for a claim not yet accrued, as for future advances.

In a few of the States of the United States it is customary to give a promissory note at the time of its inception the form and character of a confession of judgment, whereby the holder of the note is authorized at maturity, or at a specified time thereafter, to enter up judgment thereupon without further process. This extension of the principle is not, however, generally favored. See JUDGMENT; WARRANT OF ATTORNEY.

CONFESSIONS, LES, lâ kŏn'fe-syŏn' (Fr., the confessions). A remarkable autobiography of great frankness and dramatic strength, by Jean Jacques Rousseau, composed between 1766 and 1770. The work, in twelve books, was published in 1781 and 1788, after the author's death, contrary to his intention of suppressing it during the lifetime of the persons referred to in it. The confessions present the author in an unfavorable light, showing much that is base and weak in the acts admitted by him; but the work is distinguished by great narrative skill and a feeling for natural beauty.

CONFESSIONS OF AN ENGLISH OPIUM-EATER. A work by Thomas De Quincey (1821). It describes the effects of opium-eating, and is an example of impassioned prose which has few, if any, equals in English.

CONFESSIONS OF A YOUNG MAN. See MOORE, GEORGE.

CONFESSIONS OF SAINT AUGUSTINE, THE. A work by Saint Augustine in thirteen books, of which the first ten are autobiographical. The remaining three are exegetical, treating the first portion of Genesis.

CONFIDENTIAL COMMUNICATION. See PRIVILEGED COMMUNICATION.

CONFIRMATION (Lat. *confirmatio*, from *confirmare*, to strengthen, from *com-*, together + *firmare*, to make firm, from *firmus*, firm). In the ancient Church, the rite so named was administered immediately after baptism, which is still the custom in the Greek and African churches. In the Roman Catholic Church, for the last 300 or 400 years, the bishops have interposed a delay of seven years after infant baptism; in the Lutheran Church, the rite is usually delayed for from thirteen to sixteen years; and in the English Church, from fourteen to eighteen years. The ceremony consists in the imposition of hands, accompanied by an invocation of the Holy Ghost as the Comforter and Strengthener. But both in the Lutheran and English churches, the ceremony is made the occasion of requiring, from those who have been baptized in infancy, a renewal in their own persons of the baptismal vow made for them by their godfathers and godmothers, who are thereby released from their responsibility. None can partake of the Lord's Supper, in these churches, unless they have been confirmed. In the Roman Catholic Church, confirmation is held to be one of the seven sacraments, and in its administration, unction and the sign of the cross are used; in addition to the imposition of hands, the person confirmed receives a light blow on the cheek, to remind him that he must in future suffer affronts for the name of Christ. In the English Thirty-nine Articles, confirmation is declared not to be one of the sacraments, and the above ceremonies have been discontinued since the Reformation. See SACRAMENT.

CONFIRMATION. In old English law, a conveyance of an estate or right in lands to one who has the possession or some estate therein, the object being to confirm or render sure and indefeasible an estate which, but for such confirmation, is defective and voidable. It may be illustrated by the case of a disseizin, where the disseizee, or rightful owner, confirms the estate of the disseizor, who is in adverse possession of the land, vesting an absolute and indefeasible title in the latter. A confirmation was effected by deed and was nearly equivalent to a release (q.v.), by which it has been superseded. The confirmation is now, as a separate mode of conveyance, obsolete, though the term is still sometimes employed to describe the release of an outstanding claim to land to the party in possession. See CONVEYANCE.

CONFISCATION (Lat. *confiscatio*, from *confiscare*, to confiscate, from *com-*, together + *fiscus*, basket, treasury). The forfeiture of lands or goods to the Crown or State. At Rome *bona confiscata* were goods forfeited to the Emperor's treasury. Though sometimes employed in English and American law as synonymous with *forfeiture* for crime, confiscation is, at common law, a term of much more limited signification, and should probably be confined to the cases of the seizure by the Crown of waifs (*bona waviata*), or goods scattered by a thief in his flight, and of goods found in the possession of a felon and dis-

claimed by him. See ESCHEAT; FORFEITURE; EMINENT DOMAIN.

Under certain statutes, however, the State exercises the right to confiscate goods for violation of law, as in case of false entries of goods under customs and other revenue laws, and for violations of excise and internal revenue laws of the United States. The seizure and sale of real property by the State for non-payment of taxes is a similar proceeding.

Both international law and municipal law recognize the right of the sovereign authorities to confiscate the goods of an alien enemy found within the State, but the right is in fact seldom exercised in modern times.

CONFLICT OF LAWS. An opposition or contrariety between the laws of different jurisdictions affecting the rights of the same individual. In the decision of legal controversies every court regularly applies its own law (*lex fori*), i.e. the law prevailing within its jurisdiction; but exceptionally, and not infrequently, justice requires, and the domestic law itself authorizes, the application of foreign law. The cases in which the question arises whether domestic or foreign law should be applied are figuratively termed cases of conflict; and 'conflict of laws' is the title under which it is customary to set forth the rules by which such conflicts are adjusted. Because this branch of the law has been of international growth, and because the rules applied in the different nations are in the main similar, it is sometimes described as 'international private law.' Apart from other objections, this term is too narrow; for the rules in question apply not merely to conflicts between the laws of different nations, but also to conflicts between different cantonal or provincial laws within the same State, and to conflicts between the laws of different States within the same empire or federation. To a New York court, the law of New Jersey is as foreign as that of England or of France, and the same rules govern its application. This branch of modern law was developed on the Continent of Europe in the Middle Ages; and because in the later Middle Ages all purely local rules, whether of written or unwritten law, were termed statutes (*statuta*), it was first known as the doctrine of 'collision of statutes.' It took form as a body of judicial usages, but its development was largely controlled by the writings of leading jurists. Until the sixteenth century the authoritative writers were Italians (Bartolus and Baldus); from the sixteenth to the eighteenth century, they were French (Dumoulin, D'Argentré, Bouhier, and Boullenois), or Dutch (Burgundus, Rodenburg, P. and J. Voet, and Huber); in the nineteenth century the most important treatises were those of the American, Story, and the German, Savigny.

BY WHAT LAW SPECIAL RELATIONS ARE GOVERNED. Since Savigny, the effort of writers and of courts has been to determine by what local law each class of legal relations is properly governed. A substantial consensus exists on many of the chief points. (1) Domestic relations are regularly governed by the law of the husband's and father's domicile (*lex domicilii*). (2) Succession, whether testamentary or *ab intestato*, is governed by the law of the decedent's domicile. On the Continent of Europe this is generally

true of the entire estate, including realty; in England and in the United States the law of the domicile governs the distribution of the personality only. On the Continent the law of the domicile also governs the liquidation and division of a bankrupt's estate; in England this is true as regards the personality only. Everywhere the property relations of husband and wife (at least as regards personality) are governed by the law of the matrimonial domicile. (3) Real property (except on the Continent in the above cases) is governed by the law of the jurisdiction in which it lies (*lex rei sitæ*). (4) Movable things, except in the cases mentioned above (No. 2), are also governed by the law of the site, i.e. rights vested by the law of the site are respected everywhere and are not affected by the removal of the thing to another jurisdiction. (5) Contractual obligations are governed, so far as the relations between the creditor and the debtor are concerned, partly by the law of the place where the contract was concluded (*lex loci contractus celebrati*), and partly by the law of the place where the obligation is to be performed (*lex loci solutionis*). As regards transfers or assignments of the creditor's claim, however, the law governing transfers of personal property may prevail over the proper law of the contract; and claims (choses in action) regarded as assets of an estate will regularly be governed by the law of the creditor's domicile in the cases mentioned in No. 2.

Back of all these matters lie questions of capacity, (a) to take and hold property, real or personal, and (b) to act with legal result. The question of capacity to take and hold property rarely arises to-day except as regards corporations. This capacity is primarily determined by the law of the State in which the corporation was created; but it may be diminished or denied by the law of the place in which the property is situated. Questions of capacity to act are similarly determined as regards corporations, i.e. capacity must be accorded by the law of the State in which the corporation was created and also by the law of the State in which the corporation attempts to act. As regards natural persons, capacity to transmit property by will or to marry is generally determined by the law of the domicile; capacity to transfer personal property or to contract debt by the law of the place of the act (*lex loci actus*). In the United States, however, capacity to marry is governed by the law of the place of marriage. The sufficiency of the forms observed in legal acts is usually determined by the *lex loci actus*.

As regards wrongful acts, no action of tort can be maintained unless the act was wrongful (tortious) by the law of the place where it was done; and it is commonly held that it must also be tortious according to the law of the place where suit is brought (*lex fori*).

CITIZENSHIP GENERALLY IMMATERIAL. It should be noted that some European countries (Italy, Belgium, and Germany) substitute for the law of the domicile, in nearly all cases, the law of the State of which the person is (or in the case of a deceased person, was) a citizen or subject (*lex hæcænticæ, lex civitatis*); but the dominant theory makes allegiance immaterial in matters of private law.

EXCEPTIONS TO PREVIOUS GENERAL RULES. To all the above rules there is a series of exceptions.

Foreign law cannot be applied unless the domestic law permits its application. If the domestic legislator has expressly declared that a certain law is to govern all cases coming before the domestic courts, or if the purpose of the law would be thwarted by admitting exceptions, foreign law cannot be applied. Nor will foreign law be applied when its application would contravene the settled policy of the domestic law.

Finally, foreign law is applied only as regards questions of right, not as regards remedies—a rule which, properly construed, means that rights are to be enforced according to the methods prescribed by the domestic law.

PROOF OF FOREIGN LAW. Foreign law is said to be a question of fact. According to the sounder theory, this does not mean that it is a question for the jury; it means that the court is not bound to know foreign law, and may demand evidence concerning it.

FOREIGN JUDGMENTS. A foreign judgment is recognized as conclusive on the facts and on the law when it is a final judgment on the merits of the case by a competent court, i.e. by a court having jurisdiction. Whether the foreign court had jurisdiction is, however, a question which the domestic court will investigate, and will decide on principles of general jurisprudence, i.e. according to its own view of those principles.

Consult: Story, *Commentaries on the Conflict of Laws* (8th ed., edited by Bigelow, Boston 1883); Wharton, *Treatise on the Conflict of Laws: or, Private International Law, Including a Comparative View of Anglo-American, Roman, German, and French Jurisprudence* (2d ed., Philadelphia, 1881); Westlake, *Treatise on Private International Law* (3d ed., London, 1890); Dicey, *A Digest of the Law of England with Reference to the Conflict of Laws*, American notes by J. B. Moore (Boston, 1896). Two valuable German treatises—those of Savigny and Bar—have been translated into English, the former by Guthrie, under the title *Private International Law* (2d ed., Edinburgh, 1880), the latter by Gillespie, under the title *International Law, Private and Criminal* (Boston, 1883).

CONFORMITY (Fr. *conformité*, from Lat. *conformis*, like, from *com-*, together + *forma*, shape). In geology, the succession of two series of sedimentary or igneous strata in regular order. Such strata are said to be 'conformable,' and bear evidence of having been laid down continuously and without disturbance. The term 'conformability' is frequently used as a synonym of conformity. See UNCONFORMITY; GEOLOGY.

CONFRONTÉ, kôn-frôn'tá; Fr. pron. kôn'-frôn'tá' (Fr., confronted). In heraldry, a term which signifies facing or fronting one another. It is the same as combatant. See HERALDRY.

CONFUCIUS, kôn-fü'shî-ûs (Latinized form of Chinese *Kung-fü-tze*, the Master Kung) (c.551-478 B.C.). The most famous of all the sages of China. He was born in the State of Lu in the province which is now called Shan-tung. His lineage is traced by native tradition to Hang Ti, one of the early mythical rulers of China, although Confucius himself was the son of a soldier, Kung Shuh-Liang Heh, who was in command of the District of Chow. When a very old man, Heh wedded Chang Tsai in 552, and about a year later had as a son the future sage. When Confucius was but three years old, he lost his

father, but the boy was most carefully educated by his mother, and trained according to the highest ideals of China. At an early age he gave evidence of his exceptional abilities and his regard for ancient customs, while his thirst for learning was insatiable. When only seventeen years old he was manager for a wealthy landowner of Lu, and two years later he married. As in the case of other great teachers, however, notably Buddha, and later, Rama Krishna of India, Confucius seems to have been little adapted for family life. He had one son, who was born in 531, and, it would seem, two daughters. After four years he parted from his wife, but doubtless with unbroken friendship on both sides. The real life work of Confucius began when he was twenty-two, and from that time till his death, a period of fifty-one years, he led the life of a teacher, migrating frequently from place to place. His conduct on the death of his mother, which occurred in 527, is significant as showing the bent of his mind. With a filial devotion very rare at that epoch, he erected a large mound over her as she lay in the same grave with his father, and for twenty-seven months remained in entire seclusion. This time was probably not wasted. Doubtless his meditations during this period of mourning had considerable influence on his subsequent teachings. The effect of his rigorous observance of the ancient ceremonial custom of mourning for parents had an effect on all who knew him, and heightened their respect for his words. By the time Confucius had reached the age of thirty, he had formulated to his own satisfaction the tenets of his philosophy. In 517 he gained his first pupils of importance, and he was enabled to visit Lo-yang, the capital of the district, where he had an interview with Lao Tsz', the founder of Taoism. On his return to Lu in the following year, he found the city in a state of anarchy, and on the expulsion of the governor, who was his friend, Confucius retired with the ex-official to the neighboring State of Tsi. Here, however, he could not find a congenial home, and he returned to Lu, where he remained for the next fifteen years, carefully keeping himself aloof from all factional strife, and never slackening his devotion to his mission. At last his moral worth received its reward, and at the age of fifty-two Confucius was appointed Governor of Chung-tu, and this honor was followed by others higher still. Through the machinations of the Governor of Tsi, however, the influence of Confucius in Lu was so weakened that he left the country after four years. For thirteen years he wandered from place to place, and did not return to Lu until 485, seven years before his death. These last years were spent in well-earned retirement; but they were full of sorrow, marked by the deaths of his son and his two best-loved disciples, Yen Hui and Tsz' Lu. In 478 the teacher himself died, saddened by the fear lest he had failed to accomplish his mission. Herein he was wrong. The news of his death spread throughout the land, and called attention anew to his purity of life and teaching, so that the name of Confucius has ever since been the highest and most honored in the land to which he gave his life-long devotion. By the irony of fate he was deified after his death, and, like Buddha, Confucius, who had little belief in the supernatural, became a divinity.

Confucius was, as he himself said, not a re-

former, but a conservator. This is strikingly evident in his services to the literature of China. Although he is sometimes called a prolific author, he was in reality but a careful though voluminous editor, and he may, if this is clearly understood, be termed the founder of Chinese literature. Thus he established the canon of four of the 'five classics,' the *Shih Ching*, or Book of Poems, the *Li Ching*, or Book of Rites, the *I Ching*, or Book of Changes (originally a cosmological work), and the *Shu Ching*, or Book of Historical Documents, for which Confucius is said to have composed a preface, although merely a list of books which the *Shu Ching* once contained now remains. His one independent work, apart from his apothegms which were recorded by his disciples, is the *Chün Tsin*, or Spring and Autumn. This is an extremely dry annalistic history, very meagre in content and information, and altogether untrustworthy as a source of Chinese history, and records the events in the Province of Lu from B.C. 721 to 480.

Confucius was in no real sense of the word a religious teacher. His doctrines were entirely ethical and political. His attitude toward the supernatural may be summed up in his own words: "Respect the gods! but have as little as possible to do with them," and it is recorded that he spoke but seldom of four subjects—marvels, feats of strength, rebellions, and spiritual beings. In harmony with this attitude, he expresses no opinion concerning the immortality of the soul. He inculcates ever the duty, which he himself had observed so faithfully, of honor to parents and of obedience to temporal power. In this way the individual becomes absorbed in the family and the family in the State, which was regarded by Confucius as the highest concept on earth. For a State to be prosperous, mercy and all other virtues are necessary, and these qualities are to be manifested by the entire body of citizens. His teachings are, consequently, wholly worldly in character, and the dry maxims in which he expressed his views are permeated by a utilitarian philosophy which is devoid of any touch of idealism. His attitude toward women is the one generally current in the Orient. Metaphysical speculation, like religious investigation, is absent from his system, which sums up its principles in the five cardinal virtues—humanity, uprightness, decorum, wisdom, and truth. Confucius may perhaps be said to be China incarnate in his lack of originality; but with his devotion to the practical and his moral principles as patriot, sage, and teacher, he ranks among the foremost men that the world has ever seen. The most valuable account of Confucius is contained in the *Lun Yü*, or Philosophical Dialogues, which record his conversations, while the *Ta Hsüeh*, or Great Learning, and the *Chung Yung*, or Doctrine of the Mean, are important sources for the study of his system of philosophy.

As illustrations of the maxims of Confucius, the following characteristic ones may be cited: Learning without thought is labor lost; thought without learning is death of the mind. Riches and honor are what men desire; yet, except in accordance with right, they should not be enjoyed; poverty and degradation are what men dread; yet, except in accordance with right, they should not be avoided. What the superior man seeks is in himself; what the small man seeks is

in others. The foundation of all good is the virtue of individual men. Confucius also enunciated the Golden Rule, although in negative terms, as follows: "What ye would not that others should do unto you, do ye not unto them." Despite the negative form of this maxim, it is to all intents and purposes closely parallel to the Golden Rule as given by Christ.

Consult: Plath, *Confucius und seiner Schüler Leben und Lehren* (Munich, 1867-74); von der Gabelentz, *Confucius und seine Lehre* (Leipzig, 1888); Haug, *Confucius der Weise Chinas* (Berlin, 1880); Dvorak, *Chinas Religionen*, Band i., *Confucius und seine Lehre* (Münster, 1895); Legge, *Life and Teachings of Confucius* (London, 1887); Douglass, *Confucianism and Taoism* (London, 1879). For the original sources, Legge's translations of the *Lun Yü*, *Ta Hsüeh*, and *Chung Yung* in the first volume of his *Chinese Classics* (Hong Kong and London, 1861) should be consulted as of the first importance. The same scholar's translations of the *Texts of Confucianism* (comprising the *Shu Ching*, *Hsiao Ching*, *I Ching*, *Li Ching*, and portions of the *Shih Ching*), vols. iii., xvi., xxvii., xxviii. of the *Sacred Books of the East* (Oxford, 1879-85) are also of value.

CONFUSION (Lat. *confusio*, a mixing together, from *confundere*, to mingle or mix together, from *com-*, together + *fundere*, to pour, pour out) or GOODS. The intermingling of the goods of two or more several owners so as to be indistinguishable. This may occur voluntarily, or by agreement of all the parties concerned—as in the common case of the deposit of grain in a common storage elevator; or accidentally, as when, in case of fire or shipwreck or innocent mistake, goods are inextricably mingled together; or the confusion may be malicious and willful, as when one person takes gold belonging to another and throws it into the melting-pot with his own. In the first two cases the law adjusts the rights of the parties by making them tenants in common of the mixture, in the proportion of their respective contributions thereto, and, where the portions confused are of unequal value, in the proportion of their respective values. In the case of a willful confusion, however, the common law originally adopted the stringent rule of giving the entire mass to the innocent party, and this principle would still be applied in some common-law jurisdictions. The present tendency, however, in England as well as in the United States, is to adopt the milder rule of the Roman or civil law, either making the parties tenants in common of the mixture, as in the other cases referred to, or permitting the innocent party to recover the value of his share at the time of the confusion. Compare ACCESSION. Consult Schouler, *Treatise on the Law of Personal Property* (Boston, 1896).

CONGAREE (kōn'gá-rē') **RIVER**. A river of South Carolina, formed by the junction of the Broad and the Saluda rivers, near Columbia. (Map: South Carolina, D 3). It flows southeast, and, joining the Wateree, forms the Santee. It is 60 miles long and navigable to Grandby, two miles below Columbia. At this city it furnishes considerable water-power.

CONGÉ D'ÉLIRE, kōn'zhá' dá'lér' (Norman-French, Fr., permission to elect). The name

given in England to the King's warrant or permission to a dean and chapter of a cathedral to proceed to the election of a bishop to a vacant see. Since the passing of the statute 25 Hen. VIII, c. 20, with the exception of short periods in the reigns of Edward VI. and Mary, the congé d'élire has always been accompanied by a letter missive from the King, mentioning the person to be elected by name, so that in reality it is an appointment by the Crown. If the dean and chapter delay the election beyond twelve days, the appointment is effected by letter patent from the Crown; if they elect another than the person named, they incur the penalties of a *premunire*, i.e. loss of civil rights, forfeiture of their goods, and imprisonment during the royal pleasure. The same penalties are imposed upon any bishop or archbishop who neglects to assist in the consecration and investment of a bishop so elected, within twenty days after the royal announcement of his election. Consult Stephen, *Commentaries*, vol. iii. (London, 1886).

CONGENITAL DISEASE (Lat. *congenitus*, born with, from *con-*, together + *gignere*, to beget). A term used to denote any disease with which an infant enters the world. Congenital diseases may be acquired from the mother during pregnancy or during the act of delivery. In the former class belong syphilis, and, according to some authorities, smallpox. The latter class is to be separated into two subdivisions: (1) diseases obtained by infection from the parturient canal of the mother, as syphilis, gonorrhoea, septic peritonitis, purulent ophthalmia, and pyæmia; (2) conditions due to accidents occurring during delivery of the infant, such as asphyxia, atelectasis (unexpanded lungs), and cephalhematoma (tumor of the scalp containing bloody fluid). Infants may also develop an acute fatty degeneration as well as tumors of various kinds before birth.

CONGER, kōn'gēr (Lat., from Gk. γόγγρος, *gongros*, conger), or **CONGER EEL**. A marine eel (*Leptocephalus conger*) of the family Leptocephalidae, having the form of the typical eels, but no scales. The head is pointed and the mouth deeply cleft. The teeth in the outer series of either jaw are placed closely together so as to form a cutting edge. The dorsal fin commences much nearer the head than in the fresh-water eel and is confluent with the anal around the tail. The conger grows to a length of 8 feet and a weight of 25 or 30 pounds, and is almost cosmopolitan. "Congers feed chiefly by night and prey upon crustaceans, cuttles, and various kinds of fish. . . . Their favorite resorts are either hollows or crevices in the rocks or sandy bottoms, in which they can bury themselves; and in such situations they are sometimes left by the ebbing tide. The flesh of these eels is of a highly gelatinous nature, and is said to be largely employed in soups." American fishermen usually eel them sea-eels. Several Oriental species are known; and the name is sometimes applied to other similar fishes, as those of the genus *Synaphobranchus*. The conger passes through a metamorphosis, "the young being loosely organized, transparent, and band-shaped, with a very small head. The body grows smaller with age owing to the compacting of the tissues." This larval form was mistakenly described as a differ-

ent genus, *Leptocephalus*. This name, being the older, has displaced the long-used generic term, *Conger*. See EEL; and Plate of EELS, CONGERS, and MORAYS.

CONGER, EDWIN HURD (1843—). An American politician and diplomat, born in Knox County, Ill. He graduated in 1862 at Lombard University (Galesburg, Ill.), and at the Albany Law School in 1866, and in the latter year was admitted to the bar of Illinois. He served in the Federal Army during the Civil War, was brevetted major, and in 1868 set up as a stockman and banker in Iowa. From 1885 to 1891 he was a member of Congress, and at the close of the latter year was appointed Envoy Extraordinary and Minister Plenipotentiary to Brazil. In 1898 he was transferred to the embassy in China, a post of obviously greater importance. He was the only representative of a foreign power who, during the siege of Peking from June 28 to August 14, 1900, was able to send a communication to his Government. Subsequent to the siege, he was prominent in the peace negotiations between the Chinese commissioners and the foreign envoys.

CONGESTION (Lat. *congestio*, accumulation, from *congerere*, to carry together, from *com-*, together + *gerere*, to carry). An abnormal increase of blood in the vessels, due to increased pressure in the arteries or obstruction to the emptying of the veins. Emotion or exercise, by causing the heart to beat more rapidly; alcohol, or other drugs, by expanding the arteries as well as stimulating the heart; local irritation by cold, a blow, or a burn, may cause congestion of the active variety, with the production of a rosy color. A tight garter, a stooping posture, or the swelling of a finger from injury may cause passive congestion by obstructing the veins, in which case the color of the congested part is bluish or purple. In certain diseases in which the blood deteriorates, such as smallpox, typhoid fever, and septic conditions, the blood gravitates to the most dependent parts of the body, and 'hypostatic congestion' of the lungs, liver, and skin results mechanically. Congestion occurs during many diseases.

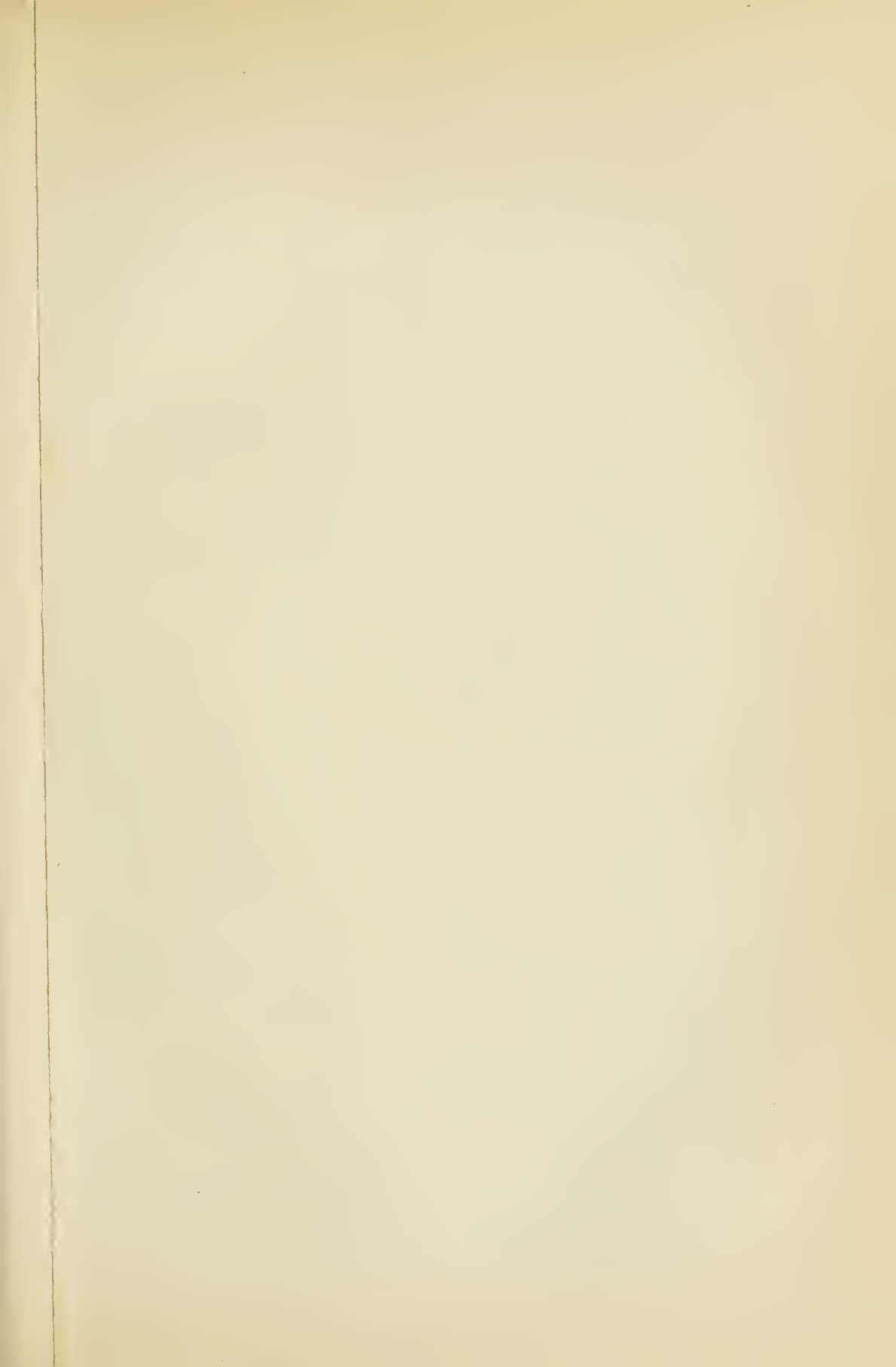
CONGLETON, kōp'g'l-ton. A market-town of Cheshire, England, on the Dane, about 26 miles south of Manchester (Map: England, D 3). Its chief industries consist of manufactures of silks and towels. Population, in 1891, 10,744; in 1901, 10,706. Congleton appears in *Domesday*, and received a charter from Henry de Lacey in the thirteenth century.

CONGLETON, HENRY BROOKE PARNELL. See PARNELL, HENRY BROOKE.

CONGLOMERATE (from Lat. *conglomeratus*, p. p. of *conglomerare*, to roll together, from *com-*, together + *glomerare*, to roll into a ball, from *glomus*, ball). A sedimentary rock (commonly called 'puddingstone') composed of pebbles cemented together by finer grained rock material. Conglomerates form along shores, and the pebbly beaches which are now forming will, when consolidated, produce conglomerates. Since conglomerates can form only in shallow water (where the force of the waves is sufficient to move pebbles), their occurrence within the strata of the earth's crust indicates an encroachment of the sea upon the land. Such an encroachment occurs during and after a subsidence

of the land beneath the sea, when deposits of sediment are laid down. Conglomerates, therefore, generally lie at the base of geological formations and serve to separate these formations from one another. Their occurrence also indicates a lost page of the record which the sedimentary rocks have furnished of the earth's history.

CONGO, kōn'g'ô, or **KONGO** (from the African tribe of *Mosicongo*). The largest, and, excepting the Nile, the longest river of Africa, and in length, volume, and drainage area, one of the great rivers of the earth. It drains most of Central Africa west of longitude 32° E., from latitude 8° N. to 12° S. It has its source in the mountain region in latitude 9° S. and longitude 32° E., at a point a little southeast of Lake Tanganyika (Map: Africa, F 5). The headstream is the Zambesi River, which flows southwest and enters Lake Bangweolo (altitude, about 3800 feet). The outlet of this lake, known as the Luapula River, flows southwestward, then northward, and enters Lake Moero (altitude 2900 feet). The outlet of this latter lake, still called the Luapula, flows northwestward and, in latitude 7° S., longitude 27° E., joins the Lualaba River, which flows north from its source in Katanga, in latitude 12° S., longitude 26° E., to form the Congo by its junction with the Luapula. About 60 miles north of the confluence of the Luapula and the Lualaba the Congo is joined by the Lukuga, the outlet of Lake Tanganyika (altitude, 2700 feet). Below this point several minor tributary streams are received by the Congo, mainly from the eastern side, until, at the equator, in longitude 24° 30' E., at a point about 80 miles below Stanley Falls, the Congo is joined by the Lomami, which has a parallel course on the west. Eastward of this point the Congo begins its great bend toward the west. About 60 miles below the entrance of the Lomami, the Aruwimi enters the Congo from the east, and still farther down-stream there join at intervals from the north the rivers Itimbi, Mongala, Ubangi (which drains the borders of Sudan, and is a very powerful stream), Sanga, Likuala, and Mossaka, besides smaller streams; and from the south the Lulonga, Ruki, and Kasai. Below these, throughout the lower 500 miles of the river's course, only small tributaries are received. About 300 miles from the mouth of the Congo is Stanley Pool, an enlargement of the river. The mouth is in latitude 6° S., longitude 12° E. The basin of the Congo consists of plateaus ranging in altitude from 1000 to 3000 feet. It is in the descent from the plateau near the west coast that the impediments to navigation occur. The basin is densely forested with a great variety of broad-leaved trees, and an almost impenetrable undergrowth. The river is navigable for ocean steamers from its mouth to a point about 110 miles up-stream, where navigation is interrupted by falls and rapids; and also by steamboats from Stanley Pool to Stanley Falls, for a distance of nearly 1000 miles farther. The length of the navigable waters of the Congo system is estimated at about 9000 miles. Over 100 steamers were engaged in traffic on the upper Congo waters at the end of the nineteenth century. The completion of the Matadi Railroad has placed the middle course of the river in communication with its estuary. The Congo has a length of about 2500 miles, and





**CONGO,
ANGOLA, MOZAMBIQUE,
and other Territories of
CENTRAL AFRICA.**



EXPLANATION

	English Territory
	French "
	Portuguese "
	German "
	Italian "
	Spanish "

A 10 B 15 C Longitude 20 D East



drains an area of more than 1,400,000 square miles.

CONGO FREE STATE. An independent State under the sovereignty of King Leopold II. of Belgium, situated approximately between longitudes 12° and 30° E. and between latitudes 14° S. and 6° N. (Map: Africa, G 5). It is bounded on the north by French Congo and the Egyptian Sudan, on the east by British East Africa, German East Africa, and Northern Rhodesia, on the south by Northern Rhodesia and Portuguese West Africa, and on the west by Portuguese West Africa, the Atlantic, and French Congo. The boundaries of the State, with the Congo and Ubangi rivers on the west, and Lakes Tanganyika, Moero, Albert Edward Nyanza, and Albert Nyanza on the east, are all well defined, and the area is estimated at from 850,000 to 900,000 square miles.

The surface of Congo is a depressed plateau-basin, tilted seaward, which was seemingly occupied at a recent date by the sea. It is unbroken by mountains except in the western part near the Atlantic, but rises on its borders to elevations of 6000 feet and more. More than half of the area is covered with forests, while the remainder is composed of savannas and arable land. The chief river is the Congo (q.v.), which, together with its tributaries, drains the larger part of the country. The climate is exceedingly hot and moist, and very unhealthy for Europeans. The normal temperature ranges from 60° to 90°, and not infrequently an exceedingly hot day is followed by a chilly night. The climate in the interior is not so injurious to Europeans as that of the coast region.

The flora of Congo is very rich and varied, the forests being full of rubber-trees, and other trees yielding gums and resins. Among the cultivated plants are the coffee, cotton, yam, papaw, pineapple, cassava, corn, rice, peanut, sweet potato, banana, bean, tobacco, sorghum, and Kafir corn. The fauna includes the elephant, hippopotamus, buffalo, antelope, chimpanzee, and crocodile. Elephants and hippopotami are especially numerous, and furnish large quantities of ivory. The mineral resources of Congo are said to be very rich. Iron occurs at many localities, while copper is confined to a smaller area, but is found in very rich deposits, especially between the Kasai and the Atlantic, and also in the southern regions. Much of the surface is composed of a loose, porous, weathered rock, known as 'laterite,' which has been derived from the underlying gneisses and sandstones.

The natural agricultural possibilities of the State are very great, but the unhealthy climate, which practically forbids white immigration, largely prevents systematic agricultural development. The agricultural land is divided among the natives, the Europeans, and the State, the last partly renting its land and partly cultivating it through agents. So far the chief products are rubber, palm-nuts, and palm-oil, but coffee, cacao, tobacco, corn, bananas, and beans are also grown to a considerable extent, and recent experiments have proved that many of the European grains and vegetables can be raised successfully. There are no statistics concerning the live stock. Coffee and tobacco grow wild.

The transportation facilities of the State are mainly provided by the Congo and its several

navigable tributaries. The Congo is interrupted in its lower part, from Matadi to Leopoldville, a distance of about 200 miles, by a series of rapids—a great obstacle to direct communication between the interior of the country and the Atlantic. To obviate this difficulty, a railway line about 260 miles in length was constructed between Matadi and Leopoldville (Stanley Pool), and opened for traffic in 1898. Above the rapids the river is navigable for 1000 miles to Stanley Falls. A Belgian company has obtained a concession for the construction of about 900 miles of railway to connect the Congo at Stanleyville and Nyangwe with the lakes of Albert Nyanza and Tanganyika. The Government runs thirty-five steamers on the upper and lower Congo. The total number of miles of waterway by river and lake in the Free State is estimated at 9500. There is steam communication regularly each fortnight with Antwerp, and also frequent communication with other European ports. The construction of telegraph lines was begun in 1892, and by the end of 1900 there were about 500 miles.

There are as yet no European manufacturing plants in the Free State. In some districts the natives work in wood, ivory, and metals with no small skill.

The commerce has grown with remarkable rapidity. The general export trade, which amounted to only \$3,000,000 in 1896, rose to nearly \$10,000,000 in 1900, while the imports increased during the same period from about \$3,100,000 to over \$6,100,000. Of these exports for 1900, about 90 per cent. were special, as were also 80 per cent. of the imports for the same year. Of the total special commerce, about 83 per cent. is with Belgium; the remainder is with Great Britain, Germany, Holland, and Angola. Nearly 90 per cent. of the special exports consist of rubber, the remainder being made up of ivory, palm-nuts, palm-oil, timber, coffee, and tobacco. The chief special imports are tissues and clothing, food substances, beverages, machinery, and other metal manufactures. There is an import duty of 10 per cent. ad valorem on arms, ammunition, and salt, and of 6 per cent. on all other articles, with the exception of machinery and agricultural implements which were admitted duty free from 1892 to 1896, and since then have been liable to a duty of 3 per cent. There is an export duty on rubber and several other articles. The trade is chiefly with Belgium, Great Britain, Germany, and Holland. The principal ports are Boma and Banana, which have an annual shipping of over 900,000 tons, over one-half being Belgian. The coasting trade is small.

The central Government of the State is located at Brussels, and is constituted by the King of Belgium and a Secretary of State, the latter being at the head of the departments of Foreign Affairs, Finance, and the Interior. The King's power is not limited by a constitution, but is somewhat circumscribed by the General Act of Berlin of 1885 relative to the organization of the Congo Free State. The direct administration is in the hands of a Governor-General at Boma, assisted by a Vice-Governor-General. According to the agreement of 1890, between Belgium and the Congo Free State, the former obtained the right of annexing the latter after a period of ten years. In 1901 the question of annexation

came up before Parliament, and it was decided to continue the present form of government, reserving the right of annexation to the King alone. The departments of the local government are: Justice, defense, public force, finance, agriculture and industry, transport, marine, and public works, and superintendence of State lands. For administrative purposes, the State is divided into fourteen districts, administered by commissaries. Civil law is in force wherever the State's authority reaches. Courts of First Instance have been established, and there is a Court of Appeal at Boma, with a right of further appeal in more important cases to a superior council at Brussels. There is also a commission to protect the natives from ill treatment. The army, consisting of natives under Euporean officers and sergeants, numbers nearly 13,000 men. The chief sources of revenue are import and export duties, State domains, Government transportation lines, and portfolio taxes. The budget balances at present at about \$6,000,000, the expenditure slightly exceeding the revenue. The principal expenditures are for administration, the public domains, and the marine and transport service. The legal money is the same as that of Belgium. The total indebtedness of the State amounts to over \$32,000,000, including the 25,000,000 francs advanced by Belgium in 1890, and the loan of 50,000,000 francs, at 4 per cent., issued in 1901 for the construction of railways and other public works. The Belgian act of 1901 relinquished the repayment by the Free State of Belgium's advances and the interest thereon, and these obligations are to revive only in case Belgium decides not to annex the country.

The population has been variously estimated at from fourteen million to twice that figure. The inhabitants are mostly of the Bantu race. The Azandés, a superior native people, are found in the northeastern part, and there are many bands of pygmies along the Congo. In 1901 the European population was 2204, about half of whom were Belgians. Among the numerous 'stations' in the Free State are: Boma, the capital, situated on the Congo, about 50 miles from its mouth, and the centre of a large trade; the port of Banana, with an excellent harbor; Matadi, a promising railway point at the foot of the Congo Rapids; Ndolo, an important river port; Leopoldville, apparently destined to become the capital of the State; Stanley Pool, Equatorville, Basoko, and Stanley Falls. The religion of the natives is generally of a very low order, consisting largely of a repulsive fetishism, including cannibalism in many districts. Missionary work, though without financial support from the State, is being actively and successfully carried on at 76 missions. The instruction is educational as well as religious. The State, mainly for military purposes, has provided three agricultural and technical colonies capable of receiving 1500 boys.

ETHNOLOGY. The natives of the Congo Free State are Negroid in race, largely mixed with Hamites of Caucasian blood. The Negroid element, far from homogeneous in physical characteristics, presents a great variety of types, due to intermixture with the true negroes as well as the pygmies north of them. The natives are handsomer than the negro, shorter in stature, less dolichocephalic and prognathic, the nose is more prominent and narrower, and the forehead

less convex. Steel-gray eyes prevail in some tribes. In speech there exists over the Congo Basin the most astonishing unity. With the exception of the northern border, where true negro dialects have intruded, the languages all belong to the Bantuan family (from *aba*, or *ba*, plurality, and *ntu*, person, comes *ba-ntu*, men, people). They are agglutinative, and use the prefix almost exclusively for modifying the meaning of the fundamental term. These languages have scarcely been studied sufficiently for a minute classification. The Congolese, both men and women, are clever in handicraft. They are not mechanical, however, and it is doubtful whether one of them ever invented a machine. Evidences of a Stone Age among them are meagre. Nature having furnished iron ore easily worked in open fires, the Iron Age has had a long history among them. The women are excellent weavers; the men are excessively fond of ornament. Their art sense is most primitive. Their knowledge of nature is confined to practical acquaintance with things of use.

In social organization and customs the tribes of the Congo present the greatest varieties. In some of them the tribal bond seems loose, and cannibalism prevails to a dreadful extent. On the larger rivers and under more favorable skies, where there is an infusion of Hamitic blood and the benefit of Hamitic tuition, large empires have arisen, the form of whose government is purely despotic. Under such organization, polygamy and slavery are the legitimate types of family life. To the Bantu mind, the spirit world lies very near the material world. In faith he is an animist of the lowest type—i.e. a hecastotheist: everything is vital, a vague somebody. Moreover, there are more spirits than bodies, and they wander about night and day, benevolent and malevolent. In cult there is no definite organization for social worship, except where the Caucasian race has taught it. Religion is personal, its minister is the sorcerer or wizard, who knows how to call forth this spirit and that, to appease the powers that do harm even with human sacrifices, and to compel the services of the benevolent ones. See Colored Plate of AFRICAN RACES.

HISTORY. The Congo Free State was established as a neutral independent sovereignty in 1884. In 1876 King Leopold II. of Belgium had organized, with the cooperation of the leading African explorers and the support of several European governments, the International African Association (q.v.), for the promotion of African exploration and colonization. In the following year Henry M. Stanley called attention to the Congo country, and was sent there by the Association, the expense being defrayed by Leopold. By treaties with native chiefs, rights were acquired to a great area along the Congo, and posts were established. After 1879 the work was under the auspices of the Comité d'Etudes du Haut Congo, which developed into the International Association of the Congo. This organization sought to combine the numerous small territories acquired into one sovereign State, and asked for recognition from the civilized governments. On April 22, 1884, the United States Government, having decided that the cessions by the native chiefs were lawful, recognized the International Association of the Congo as a sovereign independent State, under the title of

the Congo Free State, and this example was followed by Austria-Hungary, France, Germany, England, Italy, the Netherlands, Portugal, Russia, Spain, and Sweden. The international conference on African affairs which met at Berlin, 1884-85, determined the status of the Congo Free State, which occupies a peculiar position among States because of the conditions surrounding it and the auspices under which it was founded. By the act of the Conference, signed February 26, 1885, the Congo Free State was declared neutral and open to the trade of all nations, the Powers reserving for twenty years the right to decide as to the taxation of imports; the navigation of the Congo and its affluents was to be free, under the supervision of an international commission; religious freedom and equality of treatment of all settlers were guaranteed; and war was declared upon the slave trade. The United States refrained from ratifying this act, on the ground that it would thereby be committed, contrary to its policy, to certain international engagements. The new State was placed under the personal sovereignty of Leopold II., who, by will, four years later, bequeathed it to Belgium. Soon, however, other interests had been acquired in Africa by the Powers, and they correspondingly lost interest in the Congo enterprise, which became less international and more Belgian. On July 31, 1890, the territories of the Congo Free State were declared inalienable, a convention between Belgium and the Congo Free State having already reserved to Belgium the right to annex the Congo State after ten years.

In accordance with the tariff reservation in the act of 1885, the international conference at Brussels in 1890 authorized the Congo Free State to levy duties on certain imports, in order to provide the needed revenue. By the Treaty of 1891 the United States established relations with the Congo Free State, providing for commercial intercourse and a consular system, and for the arbitration of any dispute under the treaty. Several separate treaties with the European States having colonial possessions in Africa adjoining the Congo Free State have defined its boundaries. The Belgian Chambers have liberally supported the King in the development of the Congo, and the ultimate transfer of the sovereignty to Belgium was acquiesced in by the European Powers because Belgium, like the Congo Free State itself, is under an international guarantee of neutrality. There is a difference of opinion in regard to the success of the work done by Belgium on the Congo. The slave trade has been restricted, if not wholly suppressed, but the officials have not been wholly successful in dealing with savage tribes in the interior, and it is doubtful to what extent the authority of the Government may be regarded as established. Critics assert that Leopold has regarded the Congo State more as a commercial enterprise to be exploited for profit than as a country to be redeemed for civilization, and that his capital has been insufficient for the expenses of so vast an undertaking. The latter is undoubtedly true. There seems to be no doubt, on the other hand, that intertribal wars and cannibalism, as well as abuses arising from the liquor traffic, have been largely reduced in the territories subject to Leopold.

BIBLIOGRAPHY. Stanley, *The Congo and the*

Founding of Its Free State (London, 1885); Burrows, *The Land of the Pygmies* (London, 1899); Hinde, *The Fall of the Congo Arabs* (London, 1897); Reeves, "The International Beginnings of the Congo Free State," in *Johns Hopkins University Studies* (Baltimore, 1894); Boulger, *The Congo State and the Growth of Civilization in Central Africa* (London, 1898), extremely laudatory of the Belgian work in this field; Raab, *Der alte und der neue Kongostaat* (Hamburg, 1892); Goebet, *Le Congo belge illustré* (Liège, 1888); Kassai, *La civilisation africaine, 1876-88* (Brussels, 1888); Blanchard, *Formation et constitution politique de l'état indépendant du Congo* (Paris, 1899); Jozon, *L'état indépendant du Congo* (ib. 1900); Wauters, *L'état indépendant du Congo* (Brussels, 1899). See AFRICA.

CONGO PEA. See PIGEON PEA.

CONGO SNAKE. A small, eel-like amphibian (*Amphiuma means*) with very small two-toed legs, and eyes covered with skin. It is found in the rice-fields of the Southern States, where it is much feared by the common folk. It is wholly harmless, and burrows in mud in search of fishes, snails, and insect-larvæ. It lays under logs, etc., a mass of eggs, which have a firm, transparent skin, and are connected by cords into a string; these seem to be guarded and kept moist by the mother. (*Bulletin United States National Museum*, No. 31, p. 220.) The *Amphiuma* is remarkable as being the only salamander possessing a voice; when angry or excited it gives a clear whistle. See AMPHIUMA.

CONGREGATION (Lat. *congregatio*, from *eongregare*, to flock together, from *com-*, together + *gregare*, to flock, from *grex*, herd). An assembly; generally a religious assembly; in its most ordinary sense, an assembly of Christians met in one place for worship. (See CHURCH.) In the Roman Catholic Church it often designates a sort of board of cardinals, prelates, and divines, to which is intrusted the management of some important branch of the affairs of the Church. For example, the *Congregation of the Index* examines books and decides on their fitness for general perusal. (See INDEX.) The *Congregatio de Propaganda Fide* consults as to the advancement of the Roman Catholic religion throughout the world. (See PROPAGANDA.) The *Congregation of Relics* inquires into the genuineness of supposed relics. The *Congregation of the Holy Office* takes cognizance of heresies, etc. (See INQUISITION.) The *Congregation of Rites* regulates the festivals and offices of new saints.

CONGREGATIONALISM. A term used in two significations at present. It designates a peculiar system of church organization and government, and as such is rightly claimed by a great family of religious bodies, of which that popularly called 'Congregational' is only one. In this usage, the word appropriately describes the polity of the Baptists, the River and the Plymouth Brethren, the Christians, the Disciples of Christ, the Unitarians, and the Hebrew synagogues. It properly describes the organization of considerable groups of Adventists, American Lutherans, and less numerous religious communions, as well as of those churches specifically called by the Congregational name. But the term 'Congregational' is employed no less appropriately in a second signification, to denote

a particular group of churches in Great Britain, the United States, Canada, and Australia, which are 'Congregational' in their government and 'Evangelical' in their type of Protestant doctrine, and stand in recognized relations of denominational fellowship one with another within the bounds of the respective countries of their location, and to some extent in international fraternal union. In this sense it is proper to speak of the Congregational denomination of the United States, or of England and Wales.

The Congregational polity, in its modern history, had its origin in the Reformation age, and was due to the belief that the Bible contains an authoritative revelation of the will of God concerning church organization, no less than a God-given revelation of religious truth. In working out the details of the Congregational system, its early expounders conceived that they were simply reproducing the divinely appointed model of the Apostolic churches. Few modern Congregationalists hold, however, that the minutiae of church government are matters of revelation, or that any one form of church organization was divinely appointed for all times, countries, and stages of civilization: though Congregationalists generally believe that their polity embodies the broad scriptural principles of fraternal equality, individual responsibility, and full-rounded independent Christian manhood. They deem it, also, peculiarly consonant with the democratic tendencies and high individual intelligence of modern civil society. As indicated in the name, Congregationalism believes the basic element in the visible organized Church to be the local congregation of Christian disciples. It holds that congregation competent to designate its own officers, admit members to communion, discipline the erring, state its faith in language of its own choosing, and order its worship as seems best suited to its needs. Each local congregation, modern Congregationalism regards as a democracy, where affairs of concern are decided by the votes of the membership, normally under the moderatorsip of the pastor—if there be a pastor in office. Like all democratic bodies, however, a Congregational church makes large use of committees, which report results rather than processes for the consideration of the body as a whole, and act as the executive arms of the congregation.

Congregationalism holds to the autonomy of the local church. It rejects the judicial system of Presbyterianism, or the supervision of any form of episcopacy, as an undue interference with the rights of the local body. But Congregationalism in America, and increasingly in Great Britain, rejects pure independency. Though one church or body of Christians has no judicial authority over another, each owes fraternal counsel to its neighbors, and no act of large importance in any single congregation should be done without seeking the advice of the representatives of sister churches. Illustrated in various ways in different countries, mutual responsibility and helpfulness are distinguishing features of the Congregational polity.

The Local Church.—The local church is held by Congregationalists to be a company of professed disciples of Christ, who have some intelligent acquaintance with Christian truth, and personal experience of the saving work of Christ. Hence admission to church-membership is based

on evidence of intelligent determination to lead a Christian life. Such a company of Christians is knit together into a church by the covenant which they make with God and one with another, to live as those who have God for their Father and Christ for their Saviour, and to join in the worship, seek the welfare, and submit to the discipline of the particular local body of believers of which they are members. In early Congregationalism, and in American practice to the present day, this covenant, which each local congregation may express in whatever way seems best to it, was written; in Great Britain written covenants are now rare. In addition to a written covenant, it is usual for American Congregational churches of the present day to have a brief confession of faith, assent to which is required of would-be members. Such local confessions, though not unknown, are unusual in Great Britain. Examination of candidates for membership as to their knowledge of Christian truth has prevailed since the beginnings of Congregationalism; but the local confession of faith, though occasionally exemplified in New England during the seventeenth and eighteenth centuries, attained general use in America during the doctrinal discussions of the opening years of the nineteenth century. Each local church is free to express its faith in its own language, and such confessions, like the examination of candidates for church-membership, have steadily tended toward greater catholicity and simplicity. While Congregationalism recognizes no creed-statement as binding on a local church save that which the church may itself adopt, Congregationalists have never hesitated, in their representative gatherings, to adopt confessions of faith. These have the value of a testimony to the common faith of the churches, and have never been regarded as creed-tests. Thus, the exiled London Congregationalists put forth a confession in 1596; the Cambridge Synod, representing the churches of New England, approved the doctrinal parts of the Westminster Confession in 1648. Ten years later, a meeting representative of the Congregational churches of England put forth a modified form of the Westminster Confession, known, from the place of their assembly, in the Savoy, in London, as the 'Savoy Declaration'; and meetings of the delegates of the Massachusetts churches in 1680, and of those of Connecticut in 1708, set their approval, save for slight changes, on this work of the Savoy Synod. The 'Congregational Union of England and Wales' put forth a statement of 'Principles of Religion' in 1833; the 'National Council of the Congregational Churches of the United States' adopted the 'Burial Hill [Plymouth, Mass.] Declaration' in 1865; and in 1883 a commission appointed by the 'National Council' three years before reported a creed that has had wide acceptance among American Congregationalists, and has been adopted as their statement of faith by many local churches.

Doctrinal Position.—The doctrinal position of early Congregationalism was that of general Puritan or Presbyterian Calvinism. It was not on doctrinal grounds that the founders of New England left their homes. They were wholly one theologically with the Puritan Party of the English Civil War, with which they and the English Congregationalists were alike associated. His-

torically considered, American and English Congregational theological development has been along Calvinistic lines; but, as in other Protestant bodies, the peculiar problems of seventeenth-century debate have ceased to arouse interest. Calvinistic and Arminian interpretations of the way of salvation, as far as there is present significance in either interpretation, are regarded as alike acceptable. The doctrinal position of modern Congregationalism is that common Protestantism which is known as 'Evangelical.' Its ministry and churches, as a whole, however, while holding broadly to the system of Christian doctrine characteristic of historic Protestantism, have been more disposed in recent years than many Protestant bodies to welcome the new interpretations of Christian truth, and of its sources, which current theological discussions in Europe and America have presented.

Officers and Support.—Early Congregationalism, following what was believed to be the Scripture model, held that a completely organized local church should have five classes of officers—a 'pastor' and a 'teacher,' both of whom should preach and administer the sacraments; a 'ruling elder,' who should aid in church discipline; 'deacons,' to care for the poor and assist at the Lord's Table; and 'widows,' to aid in nursing among the sick. But little of this elaborateness of organization survived the end of the seventeenth century, and by that time the officers of a Congregational church had become reduced almost universally to a pastor and several deacons. The development of the nineteenth century added to these officers in practically every church a clerk, a treasurer, and a Sunday-school superintendent; and, in churches of size, a 'prudential committee,' to serve with the other officers as advisory to the pastor. In early Congregationalism, the pastor, teacher, and ruling elder were salaried officers. Since the cessation of teachers and ruling elders, the pastor has been the only paid officer of an ordinary Congregational church. In the earliest Congregationalism everywhere, and in English Congregational practice always, the expenses of the church were met by some form of voluntary payment, by gifts, subscription, or more often in modern times by the rental of sittings in the place of worship. Modern American Congregationalism employs these voluntary methods exclusively. But during most of the Colonial history of New England the intimacy of relationship between Church and State was such that Church expenses were assessed upon the taxable property of all inhabitants not specially exempt, and such assessments were collectible like any other taxes. This continued the practice in Connecticut till 1818, and in Massachusetts till 1834. When there was but one church in a township, its pecuniary affairs were settled in the meeting of the legal voters of that township. Where two or more churches existed in the township, it was subdivided territorially into districts for voting and tax-raising, known as 'societies,' 'parishes,' or 'precincts.' The New England feeling that there should be no taxation without the consent of those taxed led, during the last third of the seventeenth century, to the assumption by the legal voters, by whom the minister's salary was assessed and paid, of a right to concur in or reject the choice of a minister by the membership of the church, and established a dual system of

entrance to the local pastorate, the election of the church requiring the confirmation of the 'society.' In the general usage of New England, and to some extent in other parts of the United States, this system has survived the loss of the right of public taxation for ecclesiastical purposes, and prevails at the present time. The ownership of the buildings used by the church and the determination and payment of the salary to its minister, remain under the control of a voluntary local legal business corporation, admission to which is secured by election, by renting sittings in the church edifice, or in a variety of ways; and this corporation, still known as the 'society' or 'parish,' has a concurrent authority in the choice of a minister. English practice has known nothing of this institution; and outside of New England the temporalities of the church have been largely placed in the hands of trustees chosen by the membership of the church, or the church itself has held title to its property and administered its pecuniary affairs. Even in New England the 'society' is falling into disuse in many places, the church itself securing the incorporation permitted by statute and assuming all the rights previously shared with the 'society.'

Worship.—Early Congregationalism, in its sharp reaction from the imposition of a written liturgy, characteristic of the days of Elizabeth and the Stuarts, went to the extreme of rejecting all written liturgy as unscriptural. Modern Congregationalism entertains no such hostility, and a considerable degree of modification of the public services of Congregationalism, by responsive reading, united repetition of the Lord's Prayer and the Apostles' Creed, and development of the musical aids to worship, has taken place in recent years. In accordance with its fundamental principle of local autonomy, Congregationalism recognizes the full right of each local church to order its worship as it sees best. But, whatever minor modifications have taken place, Congregational worship remains essentially non-liturgical. It makes the sermon central, and includes, as it has always done, the elements of preaching, free prayer, the reading of the Word of God, and singing. Till about the middle of the eighteenth century in America, and in the early Congregational practice of Great Britain, only metrical translation of portions of Scripture were deemed appropriate to be sung in public worship, and the aid of musical instruments was rejected till about the same period; but since then full freedom in the use of hymns and musical aids has prevailed.

Fellowship Between the Churches.—While each congregation is autonomous, Congregationalism believes that it is the duty of each local church to consult neighboring churches in matters of importance. This feature of Congregational practice has attained a larger development in America than in England, and is chiefly manifested by the 'advisory councils,' which American Congregationalism has employed since the time of the first settlers on New England soil. Though given a place in the theoretic exposition of early English Congregationalism, the 'advisory council' of America has no exact counterpart in modern British usage. Such ecclesiastical acts as the formation of a church, the settlement or dismissal of a pastor, and the consideration of cases of discipline from which quarrel and divi-

sion have resulted, are judged by American Congregationalism to demand the advice of neighboring churches. At the request of a church, or of a party in a divided church, the representatives of neighboring churches meet in an 'advisory council'—a temporary body assembled to consider the particular case. Its composition depends solely on the invitation, and may be drawn from a distance, though usage regards a council the majority of the membership of which is not from the vicinity as seriously irregular. Its authority is not judicial, but its advice is seldom disregarded. On completing its work, an 'advisory council' is dissolved, and the minutes are left with the church with which it met. No member of the council is taken from the church which calls it. The council does not report to any other organization than the church which asks its advice.

Early Congregationalism in England and America recognized the desirability of gatherings representing the communion as a whole in occasional important exigencies. Thus, the ministers and delegates of the New England churches gathered at Cambridge, Mass., in 1637, when the supposed heresies aroused by Mrs. Anne Hutchinson were considered, and again in 1646-48, when English religious politics induced them to formulate their system of church government in the 'Cambridge Platform.' The favor which English Congregationalists experienced from Cromwell induced an assembly at the Savoy Palace, London, in 1658, which set forth Congregational faith and practice. Besides these general gatherings, meetings of representatives of colonies and districts were held as necessity required. Massachusetts called such assemblies to consider the proper recipients of baptism in 1662, and to find remedies for the declining state of religion in 1679-80. Connecticut summoned such a gathering in the height of the excitement of the 'Great Awakening' in 1741. Less formal and distinctly ecclesiastical, but nevertheless a factor of weight in the religious life of the province, was the annual convention of ministers of Massachusetts which met from early Colonial days, at the time of the May election.

Permanent Organizations.—Local stated meetings of ministers for discussion of matters of ecclesiastical interest existed in England under the Commonwealth, and were introduced into Massachusetts in 1690. By 1705 there were five such associations in the province, by which candidates for the ministerial office were examined and licensed; and in 1708 the system was extended to Connecticut, where, besides these local gatherings, an association representative of the whole Colony was formed that has assembled annually from 1709 to the present time. Similar State bodies were organized in Vermont in 1795, in Massachusetts in 1803, in New Hampshire in 1809, and have since extended everywhere where Congregationalism has gone in America, while minor local meetings, often coextensive with county lines in their constituency, are universal in American Congregational practice. During the early part of the nineteenth century, however, the feeling was strongly manifest that these stated meetings, which were at first of ministers only, should be made really representative bodies by the admission of delegates of churches. This has been widely accomplished. In each State, and in most subdivisions of States, where Con-

gregationalism is organized, there is now a body meeting for discussion at least once a year, and composed of the pastors and the elected delegates of the churches. The pressing questions of the decade previous to the Civil War led to the gathering at Albany, in 1852, of the first convention representative of American Congregationalism as a whole that had assembled since 1648; and at Boston, in 1865, a similar representative council was held. In 1871 the "National Council of the Congregational Churches of the United States" was formed. This body has since met regularly every third year, and can hold special sessions at any time at the request of any five State organizations of churches. Its membership is elected by the local and State bodies into which the churches are grouped, and the number of delegates chosen is proportionate to the number of local churches and of the communicants in the bodies by which they are appointed. The decisions of the National Council, like those of the smaller bodies into which the Congregational churches of the United States are grouped, are not mandatory or judicial; but the free discussion of matters of common concern, their investigation by competent committees, and the recommendation of courses of action by vote, have much weight with the churches. The churches of Canada are not constituents of this 'National Council,' but are organized in the 'Congregational Unions' of 'Ontario and Quebec' and of 'Nova Scotia and New Brunswick.'

In the United States, Congregational churches are normally united by permanent representative bodies of three kinds, the larger in a true sense superior to the smaller: (1) The local association or conference; (2) the State association; (3) the National Council. The usage of Great Britain is much less developed. Independency is more nearly the condition of English than of American Congregationalism. As has been pointed out, English Congregationalism does not have the 'advisory council.' But an approximation to the American system of mutual responsibility and helpfulness exists in the county and district associations, in which English Congregational churches have long been grouped. Some of these bodies may have come down from the days of the Commonwealth; but their modern development began in Hampshire in 1781, whence they rapidly extended over England. By these 'associations' or unions the good standing of Congregational churches and ministers is certified, church advancement is superintended, and denominational fellowship variously expressed. Besides their cooperation in these local associations, the Congregational churches of Great Britain are federated in two larger bodies, the Congregational Union of Scotland, organized in 1813, and the Congregational Union of England and Wales, formed in 1832. The semi-annual meetings of the last-named assembly are the most influential events in modern English Congregational life.

The sense of mutual fellowship characteristic of modern Congregationalism has its further illustration in the formation of an 'International Congregational Council,' representative, by appointed delegates, of the churches of all lands into which Congregationalism has penetrated. Its first meeting was held at London in 1891,

and its second at Boston in 1899. Provision has been made for its continuance.

Missionary Agencies.—The benevolences of Congregationalism have called into being a large number of denominational agencies. In the United States organized home missions began with the formation of the Missionary Society of Connecticut, in 1798, and the Massachusetts Missionary Society in 1799. Similar local societies have been formed in the States where Congregationalism is strongly represented, and they serve as auxiliaries to the national Congregational Home Missionary Society, founded in 1826, to which a large share, not merely of the westward extension of Congregationalism, but of the maintenance of the feebler churches in the older States, is due. A second society by which Congregational effort is carried forward within the territory of the United States, from Porto Rico to Alaska, is the American Missionary Association, organized in 1846 by anti-slavery sympathizers, which now maintains an extensive educational and evangelistic work, chiefly among the negroes of the South, but also among the mountain whites, the Indians of the West, the Eskimos of Alaska, and the Chinese of the Pacific Coast. The Congregational Education Society, founded in 1815, has for its work the strengthening of schools and colleges in the newer portions of the land, and the assistance of worthy and needy candidates for the ministry. The work of the Congregational Church Building Society and of the Congregational Sunday-School and Publishing Society is sufficiently indicated by their titles. Congregational foreign missionary effort reaching forth from the United States is under the direction of the American Board of Commissioners for Foreign Missions, founded in 1810, and now carrying on work in India, Turkey, China, Japan, Micronesia, Africa, Austria, Spain, and Mexico. In Great Britain the work of home missions is under the charge of the Congregational Church Aid and Home Missionary Society, and that of foreign evangelization of the London Missionary Society, founded in 1795. Canadian Congregationalism has its own Foreign Missionary Society.

Theological Seminaries.—Congregationalism has always believed in an educated ministry. In order to secure a proper training for their ministers, the early New England Congregationalists established Harvard and Yale, and the course of instruction in both of those institutions of learning was long regulated by the design of equipping men for the ministry. But by the first quarter of the eighteenth century the ordinary course of collegiate instruction was increasingly felt to be inadequate for the needs of ministerial training, and the result was the foundation at Harvard, in 1721, of the Hollis professorship of divinity, and the beginnings of a similar professorship of divinity at Yale in 1746—a professorship that was not fully established there until 1755. Even more influential in the ministerial training of the eighteenth century than the instruction of these professors, was the custom, which grew into increasing prominence as the century went on, of taking a few months of training supplemental to the college course, under the guidance of some eminent pastor, before applying for ministerial licensure. Such household theological seminaries were pre-

sided over by many of the prominent pastors of New England; and among such instructors Jonathan Edwards, of Northampton, Mass.; Joseph Bellamy, of Bethlehem, Conn.; Charles Backus, of Somers, Conn.; and Nathaniel Emmons, of Franklin, Mass., were conspicuous.

The immediate cause of the establishment of theological seminaries, in the modern sense of the term, in America, was the passage of Harvard College to the control of the party soon to be known as Unitarian, in 1805. Deprived thus of control of their chief seat of ministerial training, the conservative Congregationalists of eastern Massachusetts began at once to plan for separate schools of theological instruction. Two independent designs for the establishment of a theological seminary—the one begun by representatives of the older type of New England Calvinism, and the other by men of the Edwardean sympathies—were happily combined, after much effort, in 1808, and resulted, in September of that year, in the establishment of Andover Theological Seminary, at Andover, Mass. Conspicuous in the teaching force of this institution, from its foundation to his resignation in 1846, was Leonard Woods, its first professor of theology; while Moses Stuart, from 1810 to 1848, was eminent for his services in the study of the Old Testament and in introducing the theology of Germany to the knowledge of American students. Even more conspicuous as a theological leader at Andover was Edwards A. Park, who taught in the institution from 1836 to 1881, and, from 1847 to the year last mentioned, occupied its chair of theology. Andover Seminary under its first instructors occupied a theological position which represented a union on broad and generous lines of the various shades of conservative New England opinion, in opposition to the Unitarian movement of its day. Under Professor Park the Edwardean theology was even more emphasized and developed. For twenty years past Andover has been distinguished by a cordial welcome to the newer phases of theological discussion, especially as developed in Germany.

A second theological seminary was that established at Hampden, Maine, in October, 1816, but which was removed to Bangor, Maine, in 1819, where it has since continued, and from which place it takes its name. Its most eminent theological instructor in the past was perhaps Enoch Pond, whose connection with it extended from 1832 to 1870.

In 1822 the corporation of Yale College—now Yale University—carried into execution a plan which had been entertained by them for a considerable time, by establishing a department of theology in the college, which has since been known as Yale Divinity School, and is a coordinate department of Yale University. Its first professor of theology, from its foundation to his death in 1858, was Nathaniel W. Taylor, whose type of doctrine, though belonging essentially to the historic Edwardean school, yet modified the characteristic teachings of that school in some particulars to such an extent as to receive the name 'New Haven theology,' and subjected its author to much criticism from the stricter representatives of the Edwardean party. Other conspicuous teachers of the Yale Divinity School have been Eleazar T. Pritch, from its foundation to 1852; Samuel Harris, professor of

systematic theology from 1871 to 1895; Timothy Dwight, professor of New Testament Greek from 1858 to 1886, and president of Yale University from 1888 to 1900; and George Park Fisher, its professor of Church history from 1861 to 1901.

The differences of opinion awakened by the theology of Nathaniel W. Taylor, already alluded to, led to the foundation of a school at East Windsor, Conn., in 1834, then called the Theological Institute of Connecticut, but much better known as Hartford Theological Seminary since its removal to Hartford in 1865. Its founder and first professor of theology was Benet Tyler, who occupied its most conspicuous chair till 1857. Its chief leader among its later instructors has been Chester D. Hartman, its present president, who has been connected with it since 1878, and under whom its curriculum and its equipment have been greatly developed.

Almost contemporary with the founding of the Hartford Seminary was the establishment of a theological department in connection with Oberlin College, opened under the title of Oberlin Theological Seminary, in 1835. Its most distinguished instructors have been Charles C. Finney, the eminent revivalist, whose services to it continued from 1835 to 1875; and, since his death, James H. Fairchild, who was connected with Oberlin College, as an instructor in various departments, from 1838 to his decease in 1902, and held the office of president from 1866 to 1889. Oberlin is at present distinguished by the hearty reception there given to the theology of the Ritschlian school.

The growing needs of the Middle West led to the organization, in 1854, and to the complete establishment in 1858, of Chicago Theological Seminary, an institution prevalently conservative in its broader evangelical type of theology, of which it has long been a leader in a region which looks to Chicago as its centre. Conspicuous in its teaching force have been Samuel C. Bartlett, its professor of biblical literature from 1858 to 1877, when he became president of Dartmouth College; Franklin W. Fisk, its professor of sacred rhetoric from 1859 to his death in 1901; and George N. Boardman, its professor of theology from 1871 to 1893.

The youngest of the Congregational theological schools is that known as Pacific Theological Seminary, which was established at Oakland, Cal., in 1869, and is now located at Berkeley, in the same State.

The Congregational College of Canada was founded in 1830 as a 'Congregational Academy,' at Toronto, and was removed to Montreal in 1864, where it is now located as a theological school in affiliation with McGill University.

It will thus be seen that of the American Congregational theological seminaries, Yale and Oberlin are departments of a university or a college; two others, Montreal and Pacific, are affiliated or in close geographical connection with universities; and four, Bangor, Hartford, Andover, and Chicago, are independent foundations. While some of them originated in doctrinal discussion, and they still represent in several instances somewhat dissimilar points of view, the general tendency of modern Congregational development has been to an increasing similarity in doctrinal position and in methods of instruction, so that good fellowship instead of

schism exists among all these theological seminaries at the present time.

In Great Britain, as in America, theological education has long commanded the attention of Congregationalists. Soon after the passage of the Toleration Act by the English Parliament, Congregational and Presbyterian Dissenters about London established a 'fund' to aid feeble churches and to educate candidates for the pastoral office (July 1, 1690). The union of representatives of the two parties proved but temporary, and in 1695 the 'fund' was divided, and a 'Congregational Fund Board' organized. This board still exists. By its influence, and that of eminent Congregationalists like Philip Doddridge, many 'academies' and 'colleges' were organized in the eighteenth century. These had, at first, the twofold object of training an educated ministry and of providing a general education for lay students who were debarred from university privileges by their 'dissent' from the Establishment. To some extent these two aims are still sought by the Congregational 'colleges' of Great Britain; but with the removal of disabilities from the pathway of Nonconformists who are seeking a general education these 'colleges' are laying increasing and in some instances exclusive emphasis on ministerial training. They correspond to the 'theological seminaries' of the United States.

The Congregational 'colleges' of Great Britain at the present time, are the following: (1) *New College*, London, tracing its origin to 1696, and now affiliated with the University of London. (2) *Western College*, Bristol, founded as the Western Academy, in 1752. (3) *Yorkshire United Independent College*, Bradford, dating from 1756. (4) *Cheshunt College*, Cheshunt, founded by the Countess of Huntingdon at Targarth in 1768, and now affiliated with the University of London. (5) *Hackney College*, founded by Rev. Matthew Wilks and Rev. George Collison at Hackney in 1803, and now at Hampstead. It is affiliated with the University of London. (6) *Lancashire Independent College*, Manchester, founded at Blackburn in 1816. (7) *Mansfield College*, Oxford, founded as Spring Hill College at Birmingham in 1838, and greatly strengthened by its significant reestablishment at Oxford in 1886. (8) *The Congregational Institute*, Nottingham, opened in 1861. (9) *The Congregational Memorial College*, Brecon, combining a number of institutions, the oldest of which dates from 1755, and giving special attention to Welsh students. (10) *Bala-Bangor Independent College*, Bangor, dating from 1843 and largely Welsh in its constituency. (11) *The Theological Hall of the Congregational Churches in Scotland*, Edinburgh, tracing its origin to the Congregational Academy founded at Glasgow in 1811. Congregational students are also supported by separate funds in the *Presbyterian College* at Carmarthen. In 1901-02 the students in the various institutions numbered 361.

History.—Modern Congregationalism had its rise in the discussions consequent upon the English Reformation. Its earliest advocates may properly be described as forming the radical wing of English Puritan Protestantism. But, besides the characteristics which they shared with the Puritan party, they showed several non-Puritan peculiarities. They denied the existence of a National Church; they denied that church-mem-

bership belonged to all baptized inhabitants of the kingdom; they held each church competent to regulate its own affairs. These peculiarities are so similar to those of the Continental Anabaptists, that some influence from Anabaptist sources in Congregational beginnings seems probable; but the dissimilarities existing between Anabaptists and Congregationalism are so considerable that this influence must have been indirect and unconscious. The founders of Congregationalism thought they were simply reproducing the system of the New Testament. Though a church essentially Congregational in organization existed in London as early as 1567, Congregationalism first came to significance in the work and especially in the writings of an erratic but earnestly reformatory young graduate of Cambridge, Robert Browne. Convinced that reforms such as he desired were unattainable within the Establishment, Browne organized a Congregational church at Norwich in 1580 or 1581. Compelled to seek refuge in Holland, Browne put forth several tracts in 1582, in which he urged the duty of immediate separation from the Church of England—a characteristic that gave the name 'Separatists' to these early Congregationalists. He also set forth Congregational principles with great distinctness. By 1587 Congregational preaching by Henry Barrowe, a London lawyer, and John Greenwood, like Barrowe a Cambridge graduate, had gathered a following in London and brought upon its teachers and disciples the hostility of the Government. The organization of a Congregational church in London, in 1592, was followed by the martyrdom, by hanging, of Barrowe, Greenwood, and John Penry, in 1593, and the exile of the greater portion of its membership, who found a home in Amsterdam with Francis Johnson as their 'pastor' and Henry Ainsworth as their 'teacher.'

Meanwhile a movement to secure earnest Puritan preaching was begun, about 1590, in the country region of their residence some 150 miles north of London, by Richard Clyfton, rector of Babworth, and William Brewster, a layman of Scrooby. Ecclesiastical opposition deepened the movement into Separation, and it was stimulated by the coming of Rev. John Robinson, in 1604, and Rev. John Smyth, apparently the following year. Churches were formed on the Congregational model at Scrooby and Gainsborough, probably in 1606, though the year is uncertain. Governmental opposition compelled both to seek refuge in Holland, and that of Scrooby, with Robinson as its 'pastor' and Brewster as its 'ruling elder,' found a home at Leyden in 1609. Thence a minority of its membership emigrated to New England in 1620, founding Plymouth, now in Massachusetts, in December of that year. Here the Separatist colony passed through severe struggles successfully under the leadership of Brewster, and with William Bradford, Edward Winslow, and Myles Standish as its foremost men in civil affairs.

This 'Pilgrim' emigration, as it was called, was Separatist, and Plymouth Colony numbered only about three hundred in population by the close of its first decade. It would have amounted to little had it not been unexpectedly and greatly reinforced. The policy of Charles I. impelled English Puritans to seek new homes across the ocean, and the result was the estab-

lishment of a Puritan colony at Salem in 1628. Acquaintance with the Plymouth Separatists brought recognition of the large similarity of their views, and when a church was formed at Salem, in 1629, it was organized on the Congregational model. The example thus set was followed in the formation of the succeeding Massachusetts churches. The flood tide of Puritan immigration ran strong till the political situation altered in England in 1640; and it brought to New England such men as John Winthrop in 1630, Rev. John Eliot in 1631, Rev. John Cotton in 1633, and Rev. Richard Mather in 1635, giving to Massachusetts a strong and numerous Congregational population. Slightly divergent views regarding the extent of the franchise, combined with an ardent desire to secure a fertile territory, and more personal motives, led emigrants from Massachusetts under Rev. Thomas Hooker and John Haynes, to settle in Connecticut in 1634-36; and in 1638 another company, under Rev. John Davenport and Theophilus Eaton, founded New Haven. In 1643 the four Congregational colonies united in a confederacy for mutual protection.

The settlement of New England was followed by a time of planting and developing institutions. The right to vote was restricted in Massachusetts to church members from 1631 to 1664, and in New Haven from 1639 to 1665. No such limitation ever obtained in Plymouth or Connecticut colonies. Schools received the early attention of the settlers, and the founding of Harvard in 1636, followed by the establishment of Yale in 1701, bore witness to the desire for a learned ministry always characteristic of Congregationalism, and were evidences of that interest in education which marks the denomination to the present day. Congregational polity was expounded in treatises by Cotton, Hooker, and Mather, and authoritatively defined by the Cambridge Synod in 1648. Missionary labors among the Indians, begun in 1646 by John Eliot in Newton, Mass., and by Thomas Mayhew on Martha's Vineyard, were considerably successful, resulting, by 1674, in six churches, and bringing about 4000 savages in some measure at least under the influence of the Gospel, though these results were robbed of permanence by the dying of the Indian race. The chief intellectual monument of this missionary activity is Eliot's Indian version of the Bible of 1663. The most important internal discussion of seventeenth-century New England Congregationalism was that regarding the 'Half-Way Covenant'—the question being whether persons who had themselves been baptized in infancy because of their parents' church-membership, could in turn bring their own children to baptism when they themselves were subjects of no conscious regenerative change. The decision of a meeting of Massachusetts and Connecticut ministers at Boston in 1657, and of a convention of the Massachusetts churches in 1662, was that such baptized, but not consciously regenerate, parents could bring their children to baptism and transmit the church status they themselves possessed, but could not come to the Lord's Table or vote in church affairs. Hence the nickname 'half-way.' Though never universally adopted, the Half-Way Covenant was practiced by most New England churches till about the opening decade of the nineteenth century.

Though the majority of the Puritan party in England remained Presbyterian during the seventeenth century and controlled the Westminster Assembly, English Congregationalism had five sturdy champions in that convention; and in the army, as well as among the people as a whole, it grew in favor as the struggle against the King continued. Under the sympathetic rule of Cromwell it reached its widest extension in seventeenth-century England. After the Restoration it suffered the disabilities imposed on Dissenters in general, until partially relieved by the Toleration Act of 1689. Yet, in spite of the labors of such men as Isaac Watts and Philip Doddridge, and the founding of 'academies' for ministerial as well as general training, the course of English Congregationalism in the eighteenth century, like the religious life of England as a whole, was one of spiritual decline, until awakened by the new spiritual impulse that came forth from the great Wesleyan revival. Quickened thus, the Congregational churches of England grew in numbers throughout the latter half of the eighteenth century, awakened to fresh zeal for missionary service at home, and a new interest in missions abroad, and became increasingly conscious of their denominational unity and desirous that that unity should find expression.

In America, the latter half of the seventeenth and the three opening decades of the eighteenth century saw a steady decline of the spiritual enthusiasm in which the churches of New England had been planted. New England life grew provincial in every respect. From this state of relative decadence the churches of New England were powerfully aroused by a series of 'revivals' beginning at Northampton, Mass., under the ministry of Jonathan Edwards in 1734 and extending throughout New England in 1740-42, in connection with a visit of Rev. George Whitefield. The movement, known as the 'Great Awakening,' stirred the spiritual life of the churches profoundly, but was so accompanied by physical demonstrations and other evidences of excitement as to lead to much division of judgment as to its merits. Partly owing to this division, and partly in consequence of the distraction accompanying the struggle for the political possession of Canada and for American independence, the 'Great Awakening' was followed by a period of comparative religious inactivity, lasting till about 1790.

The second half of the eighteenth century, however, witnessed the rise of a native modification of the historic Calvinistic theology—the 'New England Theology'—under the leadership of Jonathan Edwards, father and son, of Samuel Hopkins, Joseph Bellamy, and Timothy Dwight. This theology won its way gradually, and by 1800 was dominant in Connecticut and Vermont, and largely represented in the rest of New England. Parallel to this Edwardean development, though with much smaller following, there ran a 'Liberal' movement, represented especially in eastern Massachusetts, and corresponding to similar modifications of doctrine among the Dissenters, especially those of Presbyterian lineage, in England. This 'Liberal' theology, already manifest in the preaching of Jonathan Mayhew and Charles Chauncy before the American Revolution, was little discussed during the excitement of that struggle; but when doctrinal

debate again attracted attention and was stimulated by a great series of 'revivals,' beginning about 1790, it was found that a considerable number of Congregational churches had drifted out of sympathy with historic Christianity. Under the lead of men of ability like William Ellery Channing, the 'Liberal' movement strengthened, while the cleavage between it and more conservative Congregationalism grew to separation. The year 1815, when 'Unitarian' became the popular designation of the new 'Liberal' denomination, may be assigned as the approximate date of the schism; though Harvard College had come under the recognized dominance of the 'Liberal' party in 1805. The Unitarian division was almost strictly local, but wholly or partially involved about one-tenth of the Congregational churches then existing in the United States. The loss of Harvard College as an agency for ministerial training led the conservative majority of the churches to seek new methods of ministerial education. As a result, theological seminaries were opened at different places and times. See section *Theological Seminaries*.

Congregationalism entered Canada by way of Nova Scotia in 1753. There was a feeble church in Newfoundland as early as 1645, which died and was not revived, and Congregationalism did not reappear there until 1775.

The beginning of the nineteenth century was marked by a rapid broadening and deepening of the activities of American Congregationalism. The rise of home and foreign missions has already been indicated in speaking of the benevolent agencies of Congregationalism. With the settlement of the West, Congregationalism ceased to be confined to New England and the adjacent sections of New York. Its spread was at first slow, because of a distrust engendered by the Unitarian schism, as to its adaptability to meet frontier conditions, and a lack of denominational consciousness which led to ready affiliation with Presbyterianism. But through the efforts of men like Rev. Dr. Leonard Bacon, of New Haven, denominational consciousness was awakened; and, from the fourth decade of the nineteenth century, the planting of distinctly Congregational churches and colleges in the West has gone rapidly forward. This westward extension was greatly aided by the Albany Convention of 1852. After the Civil War, Congregationalism entered the South, but has never had a relatively large following in that section of the United States.

Congregationalism during the nineteenth century has witnessed a gradual theological development. The Edwardean school was ably carried on in somewhat divergent directions by Nathaniel W. Taylor at Yale, and by Edwards A. Park at Andover. By the middle of the century the influence of Horace Bushnell was becoming felt in a direction away from the Edwardeanism then dominant. And the last two decades have seen increasing welcome given to what is popularly termed the 'New Theology.' This tendency has met with strenuous opposition; but the division of feeling has at no time been sufficient really to threaten the denomination with schism. Nineteenth-century American Congregationalism has had its conspicuous preachers in abundance, of whom Lyman Beecher and his son, Henry Ward Beecher, Charles G. Finney, and Richard Salter Storrs may be mentioned as illustrations. It has been ready to adopt new methods of Chris-

tian work—its most successful recent contribution being the 'Young People's Society of Christian Endeavor,' founded by Rev. Francis E. Clark in 1881. Its spirit is warmly missionary, and it desires to cooperate broadly with all who are trying to advance the Redeemer's Kingdom.

English Congregationalism during the last century has been marked by much the same traits; but its existence in the face of an ecclesiastical establishment has led it to emphasize the characteristic principle of independence more proportionately than American Congregationalism. Its struggle has been largely one for equality of privilege in education and exemption from disabilities. Its most important recent educational foundation is Mansfield College, Oxford, of which Rev. Dr. A. M. Fairbairn has been principal since its opening in 1886. The same tendencies to express denominational unity in organizations for mutual helpfulness have been manifest in England as in America, though in less marked degree. Their illustration in county associations and in larger unions has already been mentioned.

Statistics.—The total number of Congregational churches in America in 1645 appears to have been 53. About 120 English Congregational churches were represented in the Savoy Convention of 1658. In 1760 Rev. Dr. Ezra Stiles enumerated the churches of this order in New England, to which region they were then almost exclusively confined, as 530. By 1816 American Congregationalism numbered about 1020 churches and not far from 100,000 communicants. The most recent statistics available (1901, in the *Year Book* of 1902) give the churches of the United States as 5753, their ministers as 5717, their members as 645,994, and their Sunday-school enrollment as 658,405. Their benevolent contributions were \$2,233,722, and their home expenditures \$7,580,655. The seven Con-

279. Canada and Newfoundland reported 137 churches and preaching stations, with 9119 members. Congregationalism in Australia and New Zealand counts 349 churches and preaching stations, with 14,176 members.

The foreign missionary activities of the United States and Canada in 1901-02 were represented by 556 missionaries, assisted by 3559 native laborers, carrying on missions in 102 foreign stations, with 525 churches organized, and an enrollment of 55,694 communicants, of whom 5623 had been added during the previous year. Statistics for the London Missionary Society, through which the outreaching work of the English Congregational churches is maintained, show that during 1900-01 it employed 438 missionaries, assisted by 5811 native laborers, in 97 stations, and ministering to 56,059 communicants, of whom about 7000 were received during the year then closing.

BIBLIOGRAPHY. The student who wishes to investigate the history of Congregationalism thoroughly will look for guidance to the bibliography of 7250 titles of publications relating to Congregationalism issued between 1546 and 1879, which was given by Rev. Dr. H. M. Dexter as an appendix to his *Congregationalism of the Last Three Hundred Years* (New York, 1880). So closely is Congregationalism interwoven with the origins of New England that any good history of New England gives much regarding its spread and workings. General sketches of American Congregationalism are those of Rev. Dr. A. E. Dunning, *Congregationalists in America* (New York, 1894); and Prof. Williston Walker, *A History of the Congregational Churches in the United States* (New York, 1894). The characteristics of Congregational religious life are treated by Rev. Dr. George Leon Walker, *Some Aspects of the Religious Life of New England* (Boston, 1897). The reader specially interested in the beginnings of Congregationalism will be aided by the work of Rev. Dr. Dexter, above cited; also, John A. Goodwin, *The Pilgrim Republic* (Boston, 1888); Rev. Dr. John Brown, *The Pilgrim Fathers of New England* (London and New York, 1895); Prof. Edward Arber, *The Story of the Pilgrim Fathers* (London, 1897); Rev. Dr. Fred. J. Powicke, *Henry Barrow, Separatist* (London, 1900). The doctrinal peculiarities of American Congregationalism have been compactly sketched by Prof. George N. Boardman, *A History of New England Theology* (New York, 1899).

No adequate brief history of English Congregationalism has been written, but the five volumes of Rev. Dr. John Waddington, *Congregational History* (London, 1869-78, new ed., 1880), treat the story at much length to the date last mentioned. Contemporary English Congregationalism is well discussed by Rev. Dr. A. H. Bradford, *The Pilgrim in Old England* (New York, 1893). The story of Scotch Congregationalism is well and briefly told by Rev. James Ross, *A History of Congregational Independency in Scotland* (Glasgow, 1900).

The main documents relating to the polity and beliefs of Congregationalism are collected by Prof. Williston Walker, *The Creeds and Platforms of Congregationalism* (New York, 1893). Brief manuals of its usages are those of Rev. Dr. H. M. Dexter, *A Handbook of Congregationalism* (Boston, 1880); and of a Committee

CONGREGATIONALISM IN 1901-02. (BASED ON STATISTICS IN THE "YEAR BOOK" OF 1902.)

COUNTRIES	Churches, Chapels, Stations	Members	Number enrolled in Sunday-schools
England and Wales.....	4,873	403,352	652,377
Scotland.....		30,270	28,473
Ireland.....		2,298	3,425
Channel Islands.....		359	472
South Africa.....	308	11,343	6,783
British Guiana.....	59	4,882	4,608
Nova Scotia and New Brunswick.....	33	954	955
Ontario.....	60	5,859	4,293
Quebec.....	26	2,064	1,374
Newfoundland.....	18	222	346
Jamaica.....	61	3,502	1,298
New South Wales.....	72	3,383	7,096
Queensland.....	43	1,189	4,032
South Australia.....	54	3,101	5,770
Victoria.....	86	3,401	7,022
Western Australia.....	20	593	1,102
New Zealand.....	22	1,683	2,216
Tasmania.....	52	829	2,001
United States.....	5,753	645,994	658,405
Am. Board Foreign Missions, on mission fields.	524	55,645	62,188
Total.....	12,064	1,180,943	1,454,236

gregational seminaries in the United States reported an attendance in 1901-02 of 379 theological students. The churches and preaching stations of Great Britain numbered 4873, their ministers 3121, and their church members 436,-

of the 'National Council,' entitled *The Council Manual for a Congregational Church* (Boston, 1896). A good sketch of the chief representative body of American Congregationalism and of the occasional conventions that preceded it, is that of Rev. E. Lyman Hood, Ph.D., *The National Council of the Congregational Churches of the United States* (Boston, 1901). English and American Congregational statistics are given in the *Year-Books* annually published on either side of the Atlantic.

CONGREGATIONAL METHODIST CHURCH, THE. A body formed in May, 1852, in Monroe County, Ga., by ministers and laymen who had withdrawn from the Methodist Episcopal Church and wished to establish a church with Methodistic doctrines, but giving the people a voice in their own government. In 1852 the first district conference was held and a Book of Discipline adopted; in 1855 the first general convention was held. Since 1881 many churches have joined the Congregational body, but in 1901 the Congregational Methodists reported 350 churches and 21,000 members. In government it is not strictly Congregational, since it has semi-annual district conferences, annual State conferences, and quadrennial general conferences, and it is admissible to carry an appeal from one to another. It admits both white and colored persons, the latter being separately organized.

CONGRESS (Lat. *congressus*, conference, from *congrēdi*, to meet together, from *com-*, together + *aradi*, to step). In international affairs, an assembly either of sovereign princes or of delegates of sovereign States for the purpose of considering matters of common interest. In the United States, where the term has now a specific meaning as applied to the National Legislature (see UNITED STATES), it had a similar origin, the first Congress being that of the delegates from the various British colonies, who met on October 7, 1765, for the purpose of considering their grievances. Previous to signing a treaty of peace, a meeting of plenipotentiaries usually takes place, to which the name of a congress is sometimes applied, though the term seems more properly to be reserved for those more important meetings at which extensive schemes of future policy are determined. The period of secular diplomatic congresses opened with the Congress of Münster and Osnabrück, which closed the Thirty Years' War by the Peace of Westphalia in 1648 (q.v.). Since then, omitting those diplomatic bodies whose object was simply to arrange terms of peace at the close of a war, the most important European congresses have been those of Vienna (1814-15), Paris (1856), Berlin (1878), and the International Peace Conference at The Hague (1899). An international 'Pan-American' congress, to discuss industrial and commercial questions, was held at Washington, from October, 1888, to April, 1890. In the winter of 1901-02 a similar congress assembled at Mexico and discussed at great length the question of international arbitration. See VIENNA, PARIS, BERLIN, CONGRESS OF.

CONGRESS, UNITED STATES. The legislative branch of the Federal Government of the United States. It was instituted by the Constitution, which prescribes its membership and defines its

powers. It has no general legislative power, such as is enjoyed by the British Parliament, and, in a lesser degree, by the legislatures of the several American States; but it has only such functions and authority as the Constitution, expressly or by necessary implication, has conferred upon it. Acting in conjunction with the President and the Federal judiciary, it exercises the sovereign power of the people of the United States, in so far as that power has been committed to the Central Government.

Congress is composed of two 'houses,' or chambers—a Senate and a House of Representatives. It is not, however, as is generally assumed to be the case, modeled upon the British Parliament, with its House of Lords and House of Commons, nor is its bicameral form due to any general agreement on the part of the framers of the Constitution that that type of legislature was theoretically preferable to a legislature of a simpler type. The Continental Congress, under whose direction the War of the Rebellion was waged, had after the adoption of the Articles of Confederation, as before, only a single chamber. But this was not of a popular character, and it is not the House of Representatives, but the Senate, which represents it in the present Congress. These first American congresses represented not the people of the Colonies and States, but the Colonies and States themselves, and it was to preserve the weight and dignity of the States among themselves and especially of the smaller and less populous States as against the larger and more influential ones, that the Senate was instituted as a counterweight to the popular branch of the National Legislature.

The Senate is composed of two Senators from each State, and its membership has accordingly varied from twenty-two in the first Congress (when eleven States constituted the Union) to ninety at the present time (1902). The Constitution prescribes that Senators shall be chosen by the legislatures of the several States for a term of six years, and constitutes them a permanent and continuing body by providing a method of classification, whereunder the term of one class shall continuously overlap that of another, the terms of one-third of the members expiring every two years. Senators must be thirty years of age and residents of the State for which they shall be chosen. The presiding officer of the Senate is the Vice-President of the United States, but he has no part in its deliberations and no vote unless the Senators are equally divided. The rule of the Congress of the Confederation which preceded the Constitution, that the voting should be by States, each State represented having one vote, was not retained in the creation of the Senate, it being provided by the Constitution that each Senator shall have an individual vote. Senators receive a compensation fixed by Congress, of \$5000 a year, with a small allowance for stationery and mileage.

The House of Representatives is not a permanent or continuing body, but its entire membership is renewed simultaneously every second year. Its members are chosen by popular vote, and it is provided that they shall be apportioned among the several States included in the Union according to their respective numbers. The Constitution, as adopted, provided that for the purpose of apportionment the popu-

lation of a State should be determined by adding to the whole number of free persons three-fifths of the whole number of slaves. The basis of apportionment fixed by the Constitution for the first enumeration was one Representative for every 30,000 inhabitants, with the proviso that each State should have at least one Representative. The first House numbered 65, and successive enumerations and apportionments have varied the number of Representatives as follows: in 1793, 105; 1803, 141; 1813, 181; 1823, 213; 1833, 240; 1843, 223; 1853, 233; 1863 (during the Civil War), 243; 1873, 293; 1883, 325; 1891, 357; 1901, 386. The basis of apportionment under the twelfth census (1900) is one Representative to every 194,182 inhabitants. This furnishes the following representation for the several States:

Alabama.....	9	Nebraska.....	6
Arkansas.....	7	Nevada.....	1
California.....	8	New Hampshire.....	2
Colorado.....	3	New Jersey.....	10
Connecticut.....	5	New York.....	37
Delaware.....	1	North Carolina.....	12
Florida.....	3	North Dakota.....	2
Georgia.....	11	Ohio.....	21
Idaho.....	1	Oregon.....	2
Illinois.....	25	Pennsylvania.....	32
Indiana.....	13	Rhode Island.....	2
Iowa.....	11	South Carolina.....	7
Kansas.....	8	South Dakota.....	2
Kentucky.....	11	Tennessee.....	10
Louisiana.....	7	Texas.....	16
Maine.....	4	Utah.....	1
Maryland.....	6	Vermont.....	2
Massachusetts.....	14	Virginia.....	10
Michigan.....	12	Washington.....	3
Minnesota.....	9	West Virginia.....	5
Mississippi.....	8	Wisconsin.....	11
Missouri.....	16	Wyoming.....	1
Montana.....	1		

It is further provided by the Constitution that Representatives shall be at least twenty-five years of age and residents of the States in which they are chosen. They receive an annual salary, determined by Congress, the amount of which at present is \$5000. The House of Representatives chooses its own presiding officer, called the Speaker, from among its members. In the process of time this has become an office of great power and importance, ranking, perhaps, next after that of the President in influence and authority. This aggrandizement of the Speaker of the House of Representatives has resulted from the control over legislation, which, as the leader of the dominant political party in the House and under the committee system which has come to prevail in Congress, he has gradually acquired. He does not, upon becoming Speaker, lose his right to vote or otherwise to participate in the proceedings of the House.

Under the Constitution the two Houses of Congress have in most respects an equal voice in legislation, the only important exception being the requirement that all revenue bills shall originate in the popular branch of the legislature. Each House is made the sole judge of its the elections, returns, and qualifications of its own members, though the times, places, and manner of holding elections for Senators and Representatives are left to the legislatures of the several States.

The ample legislative powers of Congress, which are enumerated in Sec. 8 of Art. I, and Sec. 3 of Art. IV, of the Constitution (q.v.), are limited by the veto power of the President. Every bill intended to have the force of law

must be submitted to him, after passing the two Houses separately, and, if vetoed by him, will fail to take effect, unless passed a second time and by a two-thirds vote of each House. If any bill shall not be returned by the President within ten days after it shall have been presented to him, it shall become a law in like manner as if he had signed it, unless its return be prevented by the adjournment of Congress. The Constitution provides for an annual meeting of Congress on the first Monday in December unless a different date is duly appointed by law. The President is empowered by the Constitution to call an extra session of Congress or of either House.

In addition to their legislative powers, each of the two Houses of Congress is endowed by the Constitution with important functions in the government. The House of Representatives has the sole power of impeachment, and the Senate the exclusive authority to try impeachments. In addition to this, the Senate exercises, in conjunction with the President, important executive powers in the ratification of treaties and in the confirmation of his appointments to all important offices of the Government, including the members of his Cabinet, the judges of the Supreme and other Federal courts, and even officers of the army and navy.

In the century of national life which has just closed, the balance of governmental power has insensibly shifted from the Executive to the Congress, and in Congress from the Senate to the House of Representatives. The free exercise by the Senate of its power of refusing assent to the President's nominations to office, and the extreme development of the party system in national politics, have operated in a great measure to deprive the executive of the actual power of making appointments to office; while the popular character of the House, the absolute control exercised over its business by the Speaker and other leaders of the dominant political party, and the consequent unanimity and weight of its action, have given it a marked predominance in legislation. It is both more active and more influential than the Senate, notwithstanding the fact that its great size and the enormous volume of its business have deprived it of the character of a popular deliberative assembly.

Many acute observers see in these facts a curious reproduction in our history of recent British experience in the great art of self-government. They argue that the place of Parliament in the British system is being taken by Congress in ours, while the House of Representatives seems destined to assume the supremacy over the other organs of government which has been attained by the House of Commons in England. It is a well-known fact that the Cabinet in Great Britain, which is the virtual executive, is in fact a self-constituted committee, made up of party leaders, of the House of Commons; and it is generally assumed that our executive is placed by the Constitution in an impregnable position of independence. But the leaders of the House of Representatives have, to a considerable degree, assumed the same control over the legislation which is exercised in England by the Cabinet, and it is plausibly argued that it will require no great extension of Congressional power to reduce the constitutional executive in this country to the same position of nominal authority but real

impotence as that which it holds in the British system. It is accordingly asserted that the oligarchy of party leaders who determine the membership of the standing committees of the House and control their action are already the masters of the several executive departments, determining their very organization and policy through the power over appropriations which the present organization of the House lodges in the hands of its leaders; that the business of the Government is carried on more and more through conferences, as yet informal, between the President and this Congressional cabinet, while the great heads of departments tend to become advisers of the real masters of the situation, the Congressional leaders, rather than of their nominal chief, the President. It is not denied that a strong and popular executive may stay the rising tide of Congressional supremacy for a time, but it is claimed that the appeal to the people, by which he accomplishes this, is itself a confession of the real weakness of his position. To such observers, it seems highly probable that within the lifetime of many now living the vital differences still remaining between the British and American systems will have disappeared, and that the Government of the United States will have become to all intents and purposes a government of the parliamentary or congressional type, and that this will be accomplished without formal amendment of the Constitution, by the insidious and persistent process of Congressional usurpation.

Reference has been made to the great power wielded by certain committees of the House. It remains to be noticed that the large increase in the number of Representatives and the growth in volume and complexity of the matters with which they have to deal have necessitated the reference of all bills to standing committees. These conditions have made it impossible for the House to give any real consideration even to the most important measures of legislation, and it follows that the real processes of legislation—the discussion, the sifting, the shaping of bills—is done wholly in the committee-rooms. The committees, therefore, being deliberately made up with reference to the carrying out of party policy, have acquired virtual control over the legislation of the House, their action on bills submitted to them being usually final and conclusive.

The 'committee system,' as it is called, was adopted by the House of Representatives at an early period of its history. At present there are forty-eight standing committees, which are appointed by the Speaker for each Congress, and which hold office during the life of the Congress. These committees vary in size, and are made up of members of all parties, the dominant party having an effective majority in each. The principal committees of the House are those on Rules, Appropriations, Ways and Means, Foreign Affairs, Judiciary, Commerce, Elections, Military Affairs, and Naval Affairs. The Senate, because of its smaller membership, and its tradition of dignity and deliberation, has to a large extent retained the character of a deliberative assembly, and much of the work of legislation is still actually performed by it. It has also adopted the committee system; but its committees perform the more legitimate function of sifting and shaping the bills for their

more convenient consideration by the Senate. They are appointed by vote of the Senate, and, like those of the House, hold office during the life of the Congress for which they are chosen. The most important of the Senate committees is that on Foreign Affairs, though those on Appropriations, Ways and Means, the Judiciary, and on Military and Naval Affairs, also play an important rôle in shaping legislation. For a history of the United States Congress, see the article UNITED STATES.

The leading authorities on the position of Congress in the American scheme of government are: Woodrow Wilson, *Congressional Government* (Boston, 1885), and Bryce, *The American Commonwealth* (London, 1893). See, also, the authorities referred to in the article CONSTITUTION OF THE UNITED STATES.

CONGRESSIONAL CEMETERY, A handsome cemetery near Washington containing monuments to such members of Congress as have died during their term of office. See WASHINGTON.

CONGRESSIONAL LIBRARY, See LIBRARY OF CONGRESS.

CONGRESSIONAL RECORD, The journal of the United States Congress. Up to 1799 the Senate sat with closed doors, and no reports of its proceedings were published. Since that time, an official record of the proceedings of each House is required to be published. The so-called 'executive sessions' of the Senate are secret. The journal now known as the *Congressional Record* was called from 1789 to 1824 the *Annals of Congress*; from 1825 to 1837 the *Register of Debates*; from 1834 to 1874 the *Congressional Globe*. Since 1875 its present name has been used. The *Record*, however, is not an accurate transcript of the actual proceedings. Members are allowed to revise their remarks before they appear in type; and they also frequently receive from the House 'leave to print' speeches which they have never delivered, but which appear in the *Record* as though a part of the proceedings of the session.

CONGRESSMAN AT LARGE. A member of the United States House of Representatives elected by the voters of the entire State, and not, as is customary, by those of Congressional districts. Such Congressmen are elected under the apportionment acts of Congress, and the election of a Congressman at large is merely a device adopted to give each State the proper number of representatives under the acts until the State should be redistributed. Some States have had two such members, and several one. According to a Congressional act of 1901, the ratio of Congressional representation is one Representative for every 194,182 of the population.

CONGREVE, kōn'grēv, RICHARD (1819-99). An English philosophical writer and essayist, born at Leamington. He studied under Arnold at Rugby, and afterwards at Wadham College, Oxford, of which he became successively scholar, fellow, and tutor but resigned after having become definitely a disciple of Comte. In 1855 he published a good edition of Aristotle's *Politics* (1855). Among his other publications are: *The Roman Empire of the West* (1855); *The Catechism of Positive Religion*, translated from Comte (1858); *Elizabeth of England* (1862); and *Essays Politi-*

cal, Social, and Religious (1874). He was early one of the foremost exponents of English Positivism.

CONGREVE, WILLIAM (1670-1729). A brilliant English dramatist. He was born at Bardsey, Yorkshire, and educated at Kilkenny, and at Trinity College, Dublin. He returned to England, and was entered at the Middle Temple, but did not take kindly to law. His first publication was a novel, entitled *Incognita*, really a dramatic intrigue put into narrative. His first play, *The Old Bachelor*, was produced at Drury Lane in January, 1693, and its success was remarkable. In November he brought out *The Double-Dealer*, which was a comparative failure; but his comedy, *Love for Love*, performed in 1695, was a great success, and brought to its author money and fame. *The Mourning Bride*, a blank-verse tragedy, was acted in 1697. Its success exceeded even that of his comedies, but it has long since been forgotten. Three years after, he produced a comedy, entitled *The Way of the World*, which failed completely, and disgusted him with the theatre. In other respects Congreve was a fortunate man. He held various offices, which together yielded him an income of £1200. Congreve affected to despise his theatrical triumphs, and cultivated the manners of the fine gentleman—an eccentricity which laid him open to rebuke when he was visited by Voltaire. In his later days he was afflicted with gout and blindness. He died in London, 1729, and was buried in Westminster Abbey. As a comic dramatist Congreve has been variously estimated. He was gross, but his age was gross. His plots are intricate, but they were so intended. His world is composed of wives, gallants, and husbands—and the husbands are hoodwinked. The characters have no heart, no generosity, but they play their parts brilliantly. Indeed, the wit of Congreve's dialogue is unsurpassed in our later drama. Famous essays on Congreve and the art he represents are: Hazlitt, *Lectures on English Poets and English Comic Writers* (London, 1846); Lamb, "On the Artificial Comedy of the Last Century," in *Essays of Elia* (London, 1875); Leigh Hunt, critical notice, prefixed to *The Dramatic Works of Wycherley, Congreve, etc.*, which he edited; Macaulay, review of Hunt, entitled *Comic Dramatists or Leigh Hunt* (London, 1848); and Swinburne, article on Congreve in *Encyclopædia Britannica*. Consult: Congreve's *Comedies*, ed. Ewald (London, 1887); id., ed. Street (London, 1895); and Gosse, *Life of Congreve* (London, 1888).

CONGREVE, Sir WILLIAM (1772-1828). An English engineer, the inventor of the Congreve rocket. (See ARTILLERY.) He was educated at the Royal Academy, Woolwich, received a commission in the artillery, and became controller of the Royal Laboratory at Woolwich. He was also a member of Parliament for Gatton, and later for Plymouth, and wrote various works on technological subjects, including: *Description of the Hydro-Pneumatic Lock* (1814) and *A Treatise on the General Principles, Powers, and Facility of Application of the Congreve Rocket System* (1827). He received many honors for his invention, became prominent in scientific circles, and was a favorite with George IV.

CONGRUENCE (Lat. *congruentia*, from *congruere*, to agree). In geometry, plane figures

which can be superposed so as to coincide throughout are said to be congruent. This is the Euclidean definition of equality, and indicates both quality of area and similarity of form. The symbol \cong for congruence signifies these two properties. In general it is not necessary actually to superpose the figures. If the equality of certain parts is known, the equality of the other parts can be established—e.g. if two sides and the included angle of one triangle are equal to the corresponding parts of another, the triangles are congruent, since the remaining parts are also equal and similarly placed. Congruence is related to axial and central symmetry (q.v.), and constitutes an important theory of geometry. Congruency, in modern geometry, signifies a system of elements satisfying a twofold condition. Of all possible lines, those particular lines which satisfy a given condition are together called a complex, and those which satisfy two conditions are called a congruency—e.g. all lines which intersect a given circle form a complex, and all which intersect two given circles form a congruency. The order of a congruency is the number of its rays co-planar with a given plane; the class of a congruency is the number of its lines concurrent in a given point.

In the theory of numbers, two integers are said to be congruent with respect to a third, called the modulus, when their difference is exactly divisible by the modulus. Thus, 12 and 7, 27 and 12, are congruent with respect to 5 as a modulus, since (12-7) and (27-12) are divisible by 5. This relation is expressed thus: $12 \equiv 7 \pmod{5}$, $27 \equiv 12 \pmod{5}$, and, in general, $a \equiv b \pmod{c}$. When two integers are congruent with respect to a third, either is called the residual of the other with respect to this modulus. A few fundamental theorems of congruences are: (1) If $a_1 \equiv a'_1$, $a_2 \equiv a'_2$, . . . $a_n \equiv a'_n$ (to the same modulus), then $a_1 + a_2 + \dots + a_n \equiv a'_1 + a'_2 + \dots + a'_n$. (2) If $a \equiv a'$, then $na \equiv na'$. (3) If $a \equiv a'$, $b \equiv b'$, then $ab \equiv a'b'$. (4) If $a \equiv a'$, then $a^n \equiv a'^n$. (5) If $a_1 \equiv a'_1$, $a_2 \equiv a'_2$, . . . , then $G(a_1, a_2, \dots) \equiv G(a'_1, a'_2, \dots)$, G designating any rational integral function of a_1, a_2, \dots .

In algebra, the congruence of functions is considered in addition to the congruence of numbers. When the elements considered are of the form $ax + b$ the congruence is called linear. When the elements are of the form $ax^2 + bx + c$, the congruence is called quadratic, and so on. To solve a congruence is to find the values of the unknown quantity which satisfy the congruence. Thus, to solve the quadratic congruence $x^2 \equiv 39 \pmod{49}$ is to find the number whose square gives a remainder 39 when divided by 49. These numbers are 23, 26.

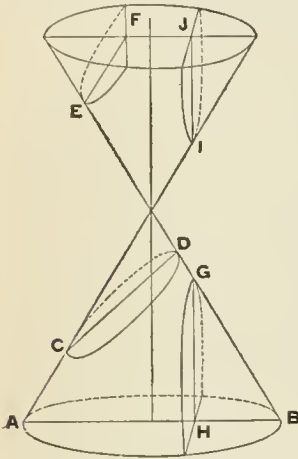
As to geometry, consult: Henrici, *Geometry of Congruent Figures* (London, 1888); Beman and Smith, *New Plane and Solid Geometry* (Boston, 1900); Plücker, *Neue Geometrie des Raumes gegründet auf die Betrachtung der geraden Linie als Raumelement*, edited by Clebsch (Leipzig, 1868); and as to algebra, Salmon, *Modern Higher Algebra* (Dublin, 1876), and Pund, *Algebra mit Einschluss der elementaren Zahlentheorie* (Leipzig, 1899).

CONI, kō'nè. See CUNEO.

CONIBO, kō-nē'bò. The most important tribe of Panoan stock (q.v.), ranging along the mid-

de Ucalayi River, northeastern Peru. For a long time they repelled the missionaries, but are now completely Christianized. In their daily life, however, they cling to their old customs, although they learn Spanish readily and prove valuable house servants. They live chiefly by boating, fishing, and gathering sarsaparilla. They paint their faces in red and blue, and wear silver rings in their lips and noses.

CONIC SECTIONS. Curves which may be formed by various sections of a cone (q.v.). In the figure, which represents the two nappes of a



right circular cone, AB, a section perpendicular to the axis, is a circle; CD, a section oblique to the axis, cutting all the elements of the conical surface on one side of the vertex, is an ellipse; EF, a section parallel to the element CI, is a parabola; and GH, IJ, a section cutting both nappes, gives the two branches of an hyperbola. These curves

were discovered by Menæchmus in the fourth century B.C., and were known for a long time as Menæchmian triads. The Greeks extensively cultivated the theory of the conic sections. Since the invention of coördinate geometry (see ANALYTIC GEOMETRY), new interest has attached to these curves, and the properties of conics form the basis of instruction in analytic geometry. See CIRCLE; ELLIPSE; PARABOLA; HYPERBOLA; CURVES; MATHEMATICS.

CONID'IA (Neo-Lat. nom. pl. from Gk. *κόνις*, *konis*, dust). Aërial spores of fungi, usually formed in chains or clusters upon the swollen end of a filament (the *conidiophore*), and never borne in spore-cases (*sporangia*). See FUNGI.

CONIDIOPHORE (Neo-Lat. *conidium* + Gk. *-φόρος*, *-phoros*, from *φέρειν*, *pherein*, to bear). A fungal filament which bears conidia, one kind of asexual spores. See FUNGI.

CONIF'ERÆ (Lat. nom. pl. of *conifer*, cone-bearing, from *conus*, cone, Gk. *κόνος*, *kónos* + *φέρω*, to bear). The greatest of the four living groups of gymnosperms. The species are all trees or shrubs, and are characteristic of the north and south temperate regions, being almost entirely absent from the tropics. Prominent representatives of the group are the pines, spruces, hemlocks, firs, larches, cedars, cypresses, redwoods, junipers, arbor-vitæ, and yews. The habit of the trees is characteristic, a central shaft extending continuously to the very top, while the lateral branches spread horizontally, with diminishing length toward the top of the tree, resulting in a conical outline. Another peculiar feature is the 'needle leaf,' which seems to be poorly adapted for foliage. It is very slender and firm, being well organized to endure cold. In some of the conifers, however, as in species of *Podocar-*

pus, the leaves are quite broad and flat; while in others, as in the arbor-vitæ, they consist of closely appressed and overlapping disk-like bodies. As the leaves have no regular period of falling, the trees are always clothed with them, and are commonly called evergreens. There are a few exceptions to this evergreen habit, however, as in the case of the common larch or tamarack, which sheds its leaves every season. The branches of conifers are apt to occur in two forms, as may be seen in the pines. There are the elongated axes, which bear only scales, known as the long shoots; and also short, spur-like, dwarf branches, which bear the clusters of needle leaves. This disposition of the foliage leaves is by no means common to all conifers, or even to all ages of the pines. In many conifers, as in spruces and in seedling pines, the needles occur on the long shoots. The structure which gives name to the group is the cone-like strobilus which bears the seeds, and which sometimes becomes very large. This, when mature, consists of heavy overlapping scales, at the base of which, upon the upper side, the seeds are found. The strobili which are made up of the stamens are never so prominent or permanent, and hence are not usually noticed. The pollination of conifers is effected by the wind, and hence the pollen is very light and powdery, and is produced in enormous quantities. In the pines the pollen-grains are assisted in this wind transportation by the development of a pair of wings, which are outgrowths from the outer coat of the spore. Sometimes strong winds carry the pollen far from the forests which produce it, and the fall of this yellow powder in places in which the phenomenon is rare gives rise to accounts of 'showers of sulphur.'

STRUCTURE. The tissues of the stems of conifers are very characteristic. The woody bundles are arranged to form a hollow cylinder, as in the dicotyledons, and hence are able to increase in diameter during each growing season. It is only the primitive bundles, however, which are made up of true vessels. All of the secondary bundles, which form the whole mass of wood, consist of tracheids, i.e. thick-walled cells resembling true vessels, but not fitted together end to end so as to form more or less continuous vessels. These tracheids are also distinguished, as in all gymnosperms, by bearing upon their walls bordered pits, i.e. thin spots which appear to be bounded by two concentric circles. They are also packed together very closely and with remarkable regularity, so that the wood is very uniform and fine-grained, and hence easily split.

CLASSIFICATION. There are two great families of conifers, the Pinaceæ and the Taxaceæ. The former has true cones, by whose scales the ovules are concealed, and whose seeds ripen dry. In general, the cones ripen dry and hard, but sometimes, as in junipers, they become pulpy, the whole cone forming the so-called 'berry.' This family (Pinaceæ) is much the larger one, and contains four well-marked tribes. Chief among these are the Abietæ, containing the pines, spruces, hemlocks, firs, larches, etc., the genus *Pinus* with its seventy species being by far the largest genus of conifers. The Cupressæ contain the various cypresses and cedars; the Taxodiæ contain the bald cypresses, redwoods, and their allies; while the Araucariæ include the Araucarian or Norfolk pines of the Southern Hemisphere. The other family, the Taxaceæ, has

exposed ovules, and the seed either ripens fleshy or has a fleshy investment. It includes two tribes—the Podocarpeæ, genera of the Southern Hemisphere (the genus *Podocarpus*, with forty species, being the second largest of the conifers), and the Taxeæ, including the yews (*Taxus*) and their allies.

Some of the conifers, as the pines and junipers, are very widely distributed, while others, like the gigantic redwoods (*Sequoia*) of California and the bald cypress (*Taxodium*) are now very much restricted. The greatest displays of much restricted ('endemic') genera occur in the China-Japan region, and in the Australasian region.

Fossil Forms. Fossil remains of Coniferæ, consisting of branches, leaves, cones, and seeds, are found in great abundance in the most recent of the Mesozoic and in the Tertiary formations, and have been referred to genera still living on account of their resemblance to them. But only when such determination is based on well-preserved cones may it, as a rule, be considered satisfactory. Leaves and leaf-bearing branches furnish only in exceptional cases a basis for the determination of the genera, as there are recent genera from different families in which the leafing branches cannot be distinguished at all by their outward appearances.

It is no better with the fossil woods, for it is known that fragments of wood having the structure of living conifers are found in every state of preservation throughout the entire series of geologic formations from the Middle Devonian upward. The great hopes entertained that they would furnish important results have, according to Solms-Laubach, not materialized, owing to the uniformity of structure which characterizes secondary growth in thickness in Coniferæ. Moreover, the Cordaites, which stand between the Cycadaceæ and Coniferæ, have a woody structure distinguishable only in entire sections of the stem. Göppert's example in dealing with the fossil woods has been followed, and they are divided into general groups according to their resemblances to the wood of modern genera, as: Araucaroxyton (*Dadoxylon*), like wood of Norfolk Pine—Araucaria; Pissodendron; Cupressoxyton, like wood of cypress; Pityoxyton, like wood of pine; Cedroxylon, like wood of cedar; Taxoxyton, like wood of yew. Of these, Taxoxyton is known only from the Tertiary; Cupressoxyton occurs only from the Chalk onward; pine and cedar woods only from the Tertiary onward. Araucaroxyton and Pissodendron are the only types of coniferous wood found in the Paleozoic formations. To Araucaroxyton probably belongs the wood of the Carboniferous pines and Dawson's species of *Dadoxylon* and *Ormoxyton*, from the Canadian Middle Devonian. But the wood of Cordaites has also the Araucaroxyton structure. The presence of true Coniferæ with this wood structure is, however, known from the Carboniferous. The stems of *Protaxites Loganii* and *Nematoxylon erassum*, from the Lower Devonian of Canada and New Brunswick, which were described by Dawson as the oldest Conifer remains, are now considered to be remains of algae.

It has been determined that the conifers originated in the Arctic region, from whence they have spread over the globe. The pines (*Pinus*) appeared first in the European early Cretaceous

beds, where their cones are found, and they became very abundant in the Tertiary. The firs are known from the Jurassic of Spitzbergen and Siberia, and the cedars date also from the Jurassic. The Araucarians, to which belong also the Taxodiæ (Bald Cypress) and the Sequoie (Redwood), are thought to be represented by the gigantic *Walehia* of Permian age. The typical American bald cypress (*Taxodium distichum*), which abounds in the swamps of Florida, occurs as the same species in the Miocene of Middle Europe. The Voltzias, so common in the Triassic sandstones of Germany, may also belong to the Taxodiæ.

The cypress appears in the Triassic with a form extremely similar to a genus now found only in Africa—*Widdringtonia*. The cedar of Lebanon, the junipers, and others, make their earliest appearance in the Cretaceous of Greenland, and are found in later formations—Upper Cretaceous and Tertiary—of Middle Europe, an indication of the migration they made with the passing of geologic time. *Salisburias* are to-day represented by a single living type, the famous ginkgo (q.v.), which was first known in the cultivated state in the groves of Chinese temples. Ginkgo is the last descendant of a once great race, with ancestors that reach back as far as the Lower Carboniferous, and flourished, during those periods, from the Triassic onward, in the northern parts of Europe, as Spitzbergen and Siberia, etc.

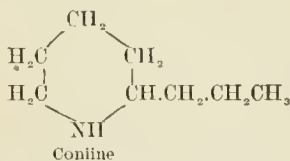
BIBLIOGRAPHY. Dawson, "The Fossil Plants of the Devonian and Upper Silurian Formations of Canada," *Canadian Geological Survey* (Ottawa, 1881, 1882); Göppert, "Monographie der fossilen Coniferen," *Naturkundige Verhandlinge van de Hollandsche Maatschappij der Wetenschappen, te Haarlem*, ser. 2, vol. vi. (Leyden, 1850); Zittel and Schimper, *Handbuch der Paläontologie*, part ii. (Leipzig, 1879-85); same, French edition (Paris, Munich, and Leipzig, 1887); H. Graf zu Solms-Laubach, *Fossil Botany* (Oxford, 1891). For illustrations, see ARaucARIA; PINES, etc.

CONIINE (from Lat. *conium*. Gk. *κόνιον*, *kōncion*, hemlock), $C_8H_{15}N$. The active alkaloid principle of hemlock, the seeds of the spotted hemlock plant (*Conium maculatum*, Linné). Being a volatile substance, coniine may be readily obtained from the seeds by distilling with water which contains a little soda in solution; coniine then passes over with the water in the form of a yellowish oil, but, when purified by redistillation, it is obtained as a colorless, transparent, oily liquid having a penetrating hemlock-like odor, communicating a burning sensation if applied to the tongue, and acting as a very energetic poison. It has a powerful alkaline reaction and precipitates metallic oxides from many salts. Strong sulphuric acid causes its compounds to assume first a purple-red and then an olive-green color, while nitric acid gives a blood-red color that fades into an orange. It is moderately soluble in water, its solutions having the property of turning the plane of polarized light to the right. If pure, it boils at $167^\circ C$.

The chief physiological effect of coniine is a powerful depression of all motor nerves, beginning at their periphery and gradually ascending to the spinal cord. As a result, all motion, voluntary and reflex, is paralyzed, although the muscles are not affected. This leads to enfeeble-

ment of the respiration and finally causes death by asphyxia. The symptoms of coniine poisoning are increasing heaviness in the legs and feebleness in the arms, dimness of vision, dilated pupils, difficulty in swallowing and breathing, and finally, loss of the voice. As coniine has no action on the brain, consciousness is preserved until the end. The following illustration will give an idea of the rapidity of its action: One drop placed in the eye of a rabbit killed it in nine minutes; three drops employed in the same way killed a strong cat in a minute and a half; while five drops, poured into the throat of a small dog, began to act in 30 seconds, and in as many more motion and respiration had ceased. In a case of coniine poisoning, emetics and the stomach-pump should be employed as early as possible; the patient's feet should be kept warm, a stimulant injected subcutaneously, and artificial respiration employed. Coniine is but rarely used as a therapeutic agent in medicine; it is extremely doubtful whether it has any useful effect at all, except perhaps in spasmodic diseases, like whooping-cough, lockjaw, or epilepsy. See HEMLOCK.

Chemically, coniine has been shown to be the dextro-rotary modification of α -propyl-piperidine, its formula being represented by the following graphic scheme:



The artificial preparation of coniine was the first synthesis of an optically active alkaloid. See also the article ALKALOIDS.

CO'NINCK. See KONINCK.

CON'INGSBY, OR THE NEW GENERATION. A novel by Benjamin Disraeli (1844). The plot is slight, and the interest of the novel is found in its political satire.

CON'INGTON, JOHN (1825-69). An English classical scholar, born at Boston, Lincolnshire. He studied at Rugby, under Dr. Arnold, in 1838-43, and at Magdalen College, Oxford, in 1843-46, and in 1846 became a fellow of University College. In 1849 he read law with much unwillingness for six months, at the London Inns of Court, and thereupon returned to the university. He contributed articles to the *Morning Chronicle* of London during 1849-50. In 1854 he was elected to the chair of the Latin language and literature at Oxford, that professorship having just been founded by Corpus Christi. His tenure of the post, continued until his death, was markedly successful, and his 'imposing personality' extended his influence far beyond his large circle of immediate pupils. His interests in connection with Latin studies were comparatively restricted. He cared little for ancient history, antiquities, or for many authors, even such great writers as Lucretius, Cæsar, Livy, and Cicero. But as a minute and careful interpreter of the more strictly literary aspects of Vergil, Horace, and Persius, and as an accurate, fluent, and generally very readable translator of all three, he gained a justly high repute. His translation (1866) of the *Aeneid* in the ballad metre of Scott, though questioned by scholars as a repre-

sentation of the manner of Vergil, is a vital piece of work, and has been much read. The renderings (1863) of the *Carmina* of Horace, and in particular of the *Satura Epistula* and *Ars Poetica* of the same author (1869), won the critical esteem of the learned. His most important work is his edition of Vergil, begun in conjunction with Goldwin Smith, and finished by Prof. Henry Nettleship (*P. Vergili Maronis Opera. The Works of Vergil, with a Commentary*, 3 vols., 1858-70; 4th ed., 1881-4). His edition of Persius, with a remarkably idiomatic prose translation, appeared in 1872. He was also a Greek scholar of fine attainments, and knew by heart the dramas of Æschylus, whose *Agamemnon* and *Choëphori* he edited (the former, with a verse-translation and notes, 1848; the latter, 1857). Consult *The Miscellaneous Writings of John Conington*, edited by J. A. Symonds (London, 1872), which contains a memoir by Prof. H. J. S. Smith.

CONINXLOO, kō'nīŋks-lō'. A family of Flemish painters, of whom the most celebrated was Gilles van Coninxloo (1544-c.1607), called the Younger. He was born at Antwerp and studied under Pieter Coek and Mostaert, but derived his chief preparation in France and Italy, making a specialty of landscape-painting. But two signed pictures by him exist, both in the Liechtenstein Gallery at Vienna. Coninxloo is known, with Bles and Gassel, as one of the few sixteenth-century artists who painted landscape otherwise than as a background for figures.

CO'NIUM. See HEMLOCK.

CONJUGAL RIGHTS. The rights which a husband or wife possesses to the companionship, society, service, and affection of the other. For any unlawful invasion of these rights by a third party, the injured spouse has a claim against the wrong-doer. One who alienates the affection of a wife from her husband is liable to him in damages; and in many of the United States the same liability is incurred by a woman who alienates a husband's affections from his wife. A spouse who violates conjugal rights may thereby afford the other a valid ground for divorce. Such misconduct, however, does not give to the innocent spouse the right to inflict chastisement, or to imprison the offender, or to obtain a decree for restoration of the conjugal relation. Both in England and in the United States the courts have declared that they have no jurisdiction to compel cohabitation where one party to the marital relation withdraws from the society of the other without justifiable cause, nor to decree a restitution of conjugal rights withheld. See COHABITATION; HUSBAND AND WIFE; MARRIAGE; and authorities there referred to.

CONJUGA'TÆ, OR POND SCUMS. See ALGÆ; CHLOROPHYCEÆ.

CONJUGATE (Lat. *conjugatus*, p.p. of *conjurare*, to join together, from *com-*, together + *jugare*, to yoke, from *jugum*, yoke; connected with Gk. *ζυγόν*, *zygon*, OChurch Slav. *igo*, Lith. *jūngus*, Goth. *juk*, Icel. *ok*, AS. *geoc*, Engl. *yoke*, OHG. *joh*, Ger. *Joch*, Skt. *yuga*, yoke). A term signifying united in pairs, and having various uses in mathematics. Conjugate *roots* are numbers, real or imaginary, such as $a + \sqrt{b}$ and $a - \sqrt{b}$, or $a + bi$, $a - bi$, satisfying a given equation. (See COMPLEX NUMBER.) Conjugate angles

are any two angles whose sum is 360° , as 10° and 350° , 400° and -40° , 180° and 180° . Conjugate *points* with respect to a conic are points each of which lies on the polar of the other. (See CIRCLE.) A conjugate *hyperbola* is one which has for its transverse and conjugate diameters the conjugate and transverse diameters of a given hyperbola. The equations of an hyperbola and its conjugate hyperbola are related thus: If $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ be the equation of the given hyper-

bola, then $\frac{x^2}{a^2} - \frac{y^2}{b^2} = -1$ is the equation of its conjugate. Conjugate *lines*, with respect to a conic, are lines each of which passes through the pole of the other. Conjugate *axes* or diameters of a conic are diameters which are conjugate lines with respect to the conic. Conjugate *triangles* with respect to a conic are triangles such that the sides of each are the polars of the vertices of the other and the vertices of each are the poles of the sides of the other. Conjugate *points* in a harmonic range are a pair of points harmonically separating two others. Thus, if A, P, B, Q, are four collinear points such that $AP:PB = AQ:BQ$, P and Q are called harmonic conjugates. Similarly in a harmonic pencil of four rays O (APBQ), OP and OQ are conjugate rays. (See ANIHARMONIC RATIO.) Conjugate *elements* of a determinant (q.v.) are those elements which are symmetrically situated with respect to the principal diagonal. Certain forms of quantities are also called conjugate.

CONJUGATE FOCUS. See LIGHT.

CONJUGATION (Lat. *conjugatio*, combination, from *conjugare*, to yoke together). IN PLANTS. A kind of fertilization, in which there is no distinction between the male and the female cells (*gametes*). It is restricted to certain low forms of algae and fungi (qq.v.). See FERTILIZATION.

CONJUGATION. A term in grammar applied to a connected view or statement of the changes of form that a verb (q.v.) undergoes in its various relations. (See INFLECTION.) The forms usually included under this term are those that serve to mark: (1) Person, or the distinction between the speaker, the spoken-to, and the spoken-of: as (I) *write*, (thou) *writest*, (he) *writes*. (2) Number; as (John) *writes*, (they) *write*. (3) Tense, or time; as (I) *write*, *wrote*, *have written*, *shall write*. (4) Mood, or the manner in which the action is presented. When the action is simply asserted, it is the indicative mood, as (he) *wrote*; when put as a supposition or condition, it is the conditional or subjunctive mood, as *if he wrote*. The imperative mood expresses a command or request, and is generally used only in the second person, as *write*. The infinitive mood expresses the action without limitation of any kind—to *write*; as it makes no affirmation, it is, strictly speaking, not a verb, but a kind of abstract noun. The two participles, the one expressing the action as in progress (*writing*), the other as completed (*written*), may be classed with the infinitive, as not affirming anything. The infinitive and the participles are sometimes called verbals. In opposition to the infinitive and the participles, the other parts of the verb are called finite. (5) Voice, or distinction between active and passive (see VERB);

as (he) *wrote* (the letter), (the letter) *was written* (by him).

In English, and in most modern European languages, the greater part of these distinctions are indicated by separate words; in Sanskrit, Greek, and Latin they were nearly all indicated by prefixes and suffixes, or other modifications of the word itself. The nature and origin of these modifications are considered under the head INFLECTION. All verbs do not take the same changes, even in the same language. Although the suffixes, e.g., may have originally been the same, yet they underwent, in course of time, different kinds of corruption or obliteration, depending upon the nature of the sounds in the root verb. This leads to the verbs of a language being arranged in different classes or conjugations. In Latin, for instance, grammarians recognize four conjugations, and verbs that cannot be brought into any class are called irregular verbs.

In English there are two distinct types of the inflections of verbs: thus, *I love* becomes in the past tense *I loved*, and in the passive voice *I am loved*; while *he shakes* becomes *he shook* and *he was shaken*. Verbs that, like *love*, take *d* (or *ed*—sometimes *t*) in their past tense and past participle form one class or conjugation, and those resembling *shake* in their changes form another. The former class is by far the more numerous; but the latter includes the most commonly used and oldest verbs in the language. The mode of change seen in *shake*, *shook*, *shaken* is believed to be more ancient than the other, and is therefore sometimes called the old conjugation, but more generally the 'strong' conjugation, the other being the new or weak. The terminology regular and irregular is incorrect. The verbs belonging to the old conjugation are all of Saxon origin, and are primitive or root verbs; while derivative verbs belong to the other class. Verbs of the weak conjugation are pretty uniform in taking *d* or *ed*, although after certain sounds the *d* is of necessity pronounced as *t*, and is sometimes replaced by that letter in writing—*dreamt*. For the vowel change in the strong conjugation, see ABLAUT. For further information on the conjugation of English verbs, consult: Lounsbury, *English Language*, rev. ed. (New York, 1894); Emerson, *History of the English Language* (New York, 1894); Skeat, *Principles of English Etymology*, vol. i. (London, 1887); and for language in general, Strong, Logeman, and Wheeler, *Introduction to the Study of the History of Language* (New York, 1891). See GRAMMAR and INFLECTION.

CONJUNCTION (Lat. *conjunctio*, from *conjungere*, to join together, from *com-*, together + *ungere*, to join; connected with Lat. *jugum*, yoke). One of the *parts of speech*, or classes into which grammarians divide words. Conjunctions serve the purpose of connecting sentences, parts of sentences, and single words; as 'Day ends and night begins. William and John learn Latin. Charles and James carried the basket between them.' In the first sentence, *and* connects two separate affirmations into one compound sentence. The same is true in the second—the separate affirmations being, 'William learns Latin,' and 'John learns Latin.' In the third sentence, *and* connects only the two words 'Charles' and 'James,' as it cannot be affirmed of either of them alone that he 'carried the

basket.' In most cases, however, it can be shown that, logically at least, two affirmations are involved, and that the conjunction really connects the affirmations. Conjunctions may also connect paragraphs. It is not easy to distinguish conjunctions from adverbs. In fact, conjunctions were all originally other parts of speech; and the greater part of them are still really adverbs, and owe their conjunctive effect to their significance as adverbs. In *and* and *but*, whatever may have been the original meaning, we now attend only to the conjunctive effect; or is a shortened form of the pronominal adjective *other*; and *nor* is *or* with the negative prefixed. In such a sentence as, 'I believe that you are wrong,' *that* is the demonstrative pronoun, equivalent to—I believe *this*, viz. 'you are wrong.' This is clearly seen in the corresponding words in other languages: Ger. *dass*, Fr. *que*, Lat. *quod* (for the relatives were originally demonstrative pronouns). All the rest might be called adverbial conjunctions, or conjunctive adverbs; as, 'He is industrious; *therefore* he is happy'—that is, 'he is happy for *that*.' This adverb, or adverbial phrase, expressive of the cause of the happiness, by referring us back for its meaning to the former assertion, has the effect of connecting the two assertions in the mind. Again, 'The messenger arrived *while* he was speaking.' Here *while* is equivalent to *at the time at which* (he was speaking). As an adverbial phrase, this simply indicates the time of the act of 'arriving'; but as it also expresses that the speaking was going on at the same time, it thus conjoins the two assertions.

The most important distinction among conjunctions will be seen in the following pair of sentences:

The sun went down, *and* the moon rose.
The moon rose, *as* the sun went down.

The first (compound) sentence contains two simple sentences or assertions, linked together, yet each standing on an independent footing; the two are joined on terms of equality, and are therefore said to be *coördinate*, and the conjunction is called a *coördinating* conjunction. In the second (complex), the last clause, though a grammatical sentence, contains no logical proposition, no assertion made for its own sake, but merely states a fact as a modifying circumstance with regard to the assertion contained in the first clause. The sentence of the second clause is therefore *subordinate* to that of the first, and the conjunction that marks the relation is a *subordinating* conjunction.

CONJUNCTION. In astronomy, one of the aspects (q.v.) of the planets. Two heavenly bodies are in conjunction when they have the same longitude—that is, when the same perpendicular to the ecliptic passes through both. If they have, at the same time, the same latitude—that is, if they are both equally far north or south of the ecliptic—they appear from the earth to be in the same spot of the heavens, and to cover one another. This phenomenon is called an eclipse in the case of the sun and moon, and an occultation in the case of the moon and a star. The sun and moon are in conjunction at the period of new moon. In the case of inferior planets, like Mercury and Venus, which revolve in orbits interior to that of the earth, there is an inferior conjunction when the planet is between the earth and the sun, and a superior

when the sun is between the earth and the planet. In general, a heavenly body is in conjunction with the sun when it is on the same side of the earth and in a line with the sun; and it is in *opposition* to the sun when it is on the opposite side of the earth, the earth being in a line between it and the sun. Planets are invisible when in conjunction with the sun, except in rare cases when an inferior planet passes over the sun's disk, and may be seen as a speck on its surface. The foregoing has reference to *geocentric* conjunctions, or such as are seen from the earth. *Heliocentric* conjunctions are analogous planetary arrangements, such as could be seen by a supposed observer on the sun. In observing a conjunction, eclipse, or occultation, from the earth's surface, it is usual to reduce the observation to what it would be if made from the earth's centre. By this means, the exact times of conjunction are more accurately fixed, and the observations of one astronomer made available to every other, wherever he may be on the earth's surface. *Grand conjunctions*, in astrology, are those where several stars or planets are found together. Chinese history records one in the reign of the Emperor Tehuenhiu (B.C. 2514-2436), which astronomers calculate to have actually taken place.

CONJUNCTION, or **SYNAPHE**. In music, the name given by the Greeks to their old system of tuning the seven-stringed lyre. The new system, which came into use with the eight-stringed lyre, was called *ἀρμονία*, *harmonia*, harmony. See GREEK MUSIC.

CONJUNCTIVI'TIS (Neo-Lat., from *conjunctiva*, connective membrane, from Lat. *conjunctivus*, connective, from *conjungere*, to join together), OPHTHALMIA, or OPHTHALMITIS. An inflammation of the conjunctiva, or the mucous membrane that covers the external surface of the eyeball, and the internal surface of the eyelids. The disease occurs in several distinct varieties, which are separately described below:

ACUTE CATARRHAL CONJUNCTIVITIS. The symptoms of this variety are redness of the surface of the eyes (the redness being superficial, of a bright scarlet color, and usually diffused in patches), sensations of uneasiness, stiffness and dryness, with slight pain, especially when the eye is exposed to the light; an increased discharge, not of tears, except at the beginning of the attack, but of mucus, which at first is thin, but soon becomes opaque, yellow, and thicker; pus (or matter, as it is popularly termed) being seen at the corner of the eye, or between the eyelashes along the edges of the lids, which it glues together during the night. The disease results from exposure to cold, damp, and dust; it may be epidemic in the spring and autumn, probably from bacterial infection; or it may be transmitted by contact with articles used by those having the disease; or finally may follow or occur during measles, smallpox, scarlet fever, influenza, hay fever, or coryza.

CHRONIC CATARRHAL CONJUNCTIVITIS. This is probably the most common disease of the eye and usually occurs in adults, generally involving both eyes. It often lasts a long time, frequently on account of the continuance of the causes which led to its appearance. Among the most important causes are: acute catarrhal conjunctivitis, improper hygienic surroundings, irritation by dust or smoke, insufficient sleep, abuse of alcohol,

and eye-strain. The conjunctiva is red and smooth, the secretion is but slightly increased.

FOLLICULAR CONJUNCTIVITIS. This is an obstinate form of chronic catarrhal conjunctivitis, and may be recognized by the small follicles or granular swellings which form under its influence upon the lower lids. It closely resembles trachoma (see *Granular Conjunctivitis*, below), commonly called 'granular lids,' and some even maintain that they are identical. Those who differ from this opinion assert that the follicles in follicular conjunctivitis disappear after a few weeks' treatment, while in trachoma there are persistent changes in the conjunctiva.

ACUTE PURULENT CONJUNCTIVITIS OF ADULTS, or Gonorrhœal Ophthalmia. This differs from catarrhal conjunctivitis in the severity of its symptoms and in its exciting causes. It is a violent form of inflammation of the conjunctiva; is accompanied with a thick, purulent discharge on the second or third day, and is very apt to occasion loss of vision. It begins with the same symptoms as catarrhal ophthalmia, but in a very exaggerated form. The conjunctiva rapidly becomes intensely red, and soon appears raised from the sclerotic by the effusion of serum between them, projecting around the cornea, which remains buried, as it were, in a pit. Similar effusion takes place beneath the mucous membrane lining the eyelids, causing them to project forward in large, livid, convex masses, which often entirely conceal the globe of the eye. These symptoms are accompanied by severe burning pain, tenderness of the eye, some constitutional symptoms, and slight fever. When the disease is unchecked, it is liable to produce ulceration or sloughing of the cornea, with the escape of the aqueous humor and protrusion of the iris; and, even when these results do not follow, vision is often destroyed by permanent opacity of the cornea.

The disease is unquestionably contagious, and arises from the application of gonorrhœal discharge or matter to the surface of the eye; and hence is most common in persons suffering from the disease from which this variety obtains its specific name. It may be conveyed directly to the eye, or by means of towels or other articles used by such a person. It is, moreover, often occasioned by the disgusting practice, adopted by the poorer classes, of bathing the eyes in human urine, under the idea that by this procedure they strengthen the sight.

PURULENT CONJUNCTIVITIS OF INFANTS, or Ophthalmia Neonatorum. This usually appears about the third day after birth. Its importance is apt to be overlooked until it has made considerable progress. The edges of the lids appear red and glued together, and the eye, when the lids are separated, shows redness and swelling of the conjunctiva. The disease, if not checked, progresses in much the same way as in adults. It is, however, much more amenable to treatment, and with proper care the sense of sight is seldom impaired, provided the disease has not extended to the cornea before medical aid is sought. Ophthalmia neonatorum is the result of gonorrhœal infection of the eyes from the mother during birth. It is practically preventable by the use of Credé's method of cleansing the eyes immediately after birth, and putting one drop of a 2 per cent. solution of silver nitrate into each eye. This is a routine practice in many of the

maternity hospitals, and has done much in these institutions, and among the better classes, to diminish the frequency of the affection.

The treatment of purulent conjunctivitis must be left entirely to a competent physician, whose advice should be sought as soon as there is the slightest suspicion of the nature of the case.

DIPHTHERITIC CONJUNCTIVITIS and Crocopous CONJUNCTIVITIS. These are forms caused by the bacillus of diphtheria.

PHLYCTENULAR CONJUNCTIVITIS, called also *Pustular Conjunctivitis, or Scrofulous Ophthalmia.* This occurs in children, especially of the lower classes, who suffer from the tuberculous or so-called scrofulous diathesis or constitution. The most prominent symptom is extreme intolerance of light, the lids being kept spasmodically closed. When they are forcibly separated, a slight vascularity, usually stopping at the edge of the cornea, is observed, and at or about the line of separation between the cornea and sclerotic small opaque pimples or pustules appear. The treatment consists (1) in improving the general health, and (2) in local applications. This form of disease, being dependent on constitutional causes, is often very obstinate, and is always liable to recur.

GRANULAR CONJUNCTIVITIS, or Trachoma, popularly known as 'granular lids.' This is a contagious affection of the eye, conveyed by means of the secretion. The contagion is most frequently carried by towels, etc., used in common by many persons, and so the disease is found chiefly in crowded and dirty houses, in schools, barracks, etc. It occurs very frequently in Arabia, Egypt, and the lowlands of Europe. In this country the negro race is comparatively seldom affected by it. The disease has been called Egyptian ophthalmia on account of its importation into Europe from Egypt during the wars of Napoleon. The Irish and Jews are especially liable to the affection. It is accompanied by a varying degree of dread of light, itching and burning of the lids, pain, flow of tears, and trouble with sight. The lids are swollen, the upper drooping; there is a variable amount of muco-purulent discharge. The conjunctiva of the lids and fornix, or fold between lids and eyeballs, is red, thickened, and covered with many small papillæ, or velvety elevations, or by granules which are round, translucent, and yellow or grayish. After a time, scar tissue forms and the papillæ and granules disappear. The disease may be acute, but usually begins gradually and lasts for years. It is believed by some that the cases in which the granulations give few or no symptoms, and there are no signs of inflammation, are not contagious. The dangerous complications are ulceration of the cornea alone or accompanying a condition known as *pannus*. In the latter, new tissue containing blood-vessels gradually forms until the upper half of the cornea is covered, occasionally the whole. If this disappears later, sight will be restored; otherwise, the new tissue causes permanent opacity, an accident which may also result from corneal ulceration. Entropion (q.v.), trichiasis (q.v.), or ectropion (q.v.), or symblepharon, a cicatricial adhesion of the conjunctiva of the lid to that of the eyeball, may follow trachoma.

The treatment of trachoma may require either local applications or surgical interference. Prevention is most important. Persons having the

disease should exercise great care that others may not use their towels or other toilet articles, which might serve to convey it; and in public institutions cases should be carefully watched for and isolated.

CONJURY (from *conjure*, OE., Fr. *conjuror*, from Lat. *conjurare*, to swear together, from *com-*, together + *jurare*, to swear, from *ius*, law). Incantation, bewitchment, or magic. Specifically, the casting of spells, or evil enchantment, characteristic of Afro-American folk-lore. See MAGIC; MAN, SCIENCE OF.

CONK'LING, ROSCOE (1829-88). An American politician. He was born at Albany, and after receiving an academic education, at the age of 17 began the study of law in the office of Speneer and Kernan at Utica. His first identification with politics was in 1848, when he won some reputation as a campaign speaker by making a number of speeches in behalf of Taylor and Fillmore. In 1850 he was admitted to the bar, and in the same year became district attorney of Albany County by appointment of Governor Fish. In 1852 he returned to Utica, where in the next few years he established a reputation as a lawyer of ability. Up to 1852, in which year he stumped the State for Gen. Winfield Scott, the Whig candidate for the Presidency, Conkling was identified with the Whig Party, but in the movement that resulted in the organization of the Republican Party he took an active part, and his work, both as a political manager and an orator, contributed largely toward carrying the State for Frémont and Dayton, the Republican nominees, in 1856. In 1858 he was elected Mayor of Utica, and in the same year was chosen a Representative in Congress, serving throughout the period of the Civil War, except in the Thirty-eighth Congress (1863-65), during which interval he acted as a Judge-Advocate of the War Department. He was again a member of Congress in 1865-67. In his career in the House of Representatives, Conkling won national distinction as a debater and orator. He was an enthusiastic supporter of the Lincoln administration in its conduct of the war, but vigorously opposed the passage of the Legal Tender Act in 1862. He was a member of the Committee of Ways and Means, and the Special Committee of Fifteen on Reconstruction, delivering one of the strongest speeches in support of the Fourteenth Amendment. His renown as an orator and prominence in the legislative councils of the Republican Party secured him in 1867, at the age of thirty-eight, an election to the United States Senate to succeed Judge Ira Harris. Conkling's career in the Senate was brilliant, but, like all the rest of his political life, erratic and marked by strong personal likes and dislikes, by which, rather than by the welfare of the nation or of his party, he was frequently controlled. Through the eight years of Grant's administration he stood out as the spokesman of the President and one of the principal leaders of the Republican Party in the Senate. He was active in framing and pushing through Congress the reconstruction legislation, and was instrumental in the passage of the second Civil Rights Act, in 1875, and of the act for the resumption of specie payments, in the same year. In the Republican National Convention at Cincinnati in 1876, Conkling first appeared as a Presidential candidate, receiving 93 votes. He was one of the framers of the bill

creating the Electoral Commission to decide the disputed election of 1876, but, when its judgment was announced, declined to vote for its affirmation. Himself an opponent of civil-service reform, Conkling was entirely out of sympathy with the reform element in the Republican Party. The first break with the administration occurred in April, 1877, when the Secretary of the Treasury, John Sherman, appointed a commission to investigate the affairs of the Custom House. The investigation brought to light extensive irregularities in the service, showing in particular that the Federal office-holders in New York constituted a large army of political workers, and that their positions were secured by and dependent upon their faithful service in behalf of the men holding the principal Government offices in the city. President Hayes decided upon the removal of Chester A. Arthur, the Collector; Gen. George H. Sharpe, the Surveyor, and A. B. Cornell, the Naval Officer of the Port, and in October, 1877, sent nominations of their successors to the Senate. Senator Conkling defended the displaced officials, and, through his influence in the Senate, secured the rejection of the new nominations. He succeeded in blocking all the efforts of President Hayes and Secretary Sherman until January, 1879, when, a new lot of nominations having been made, they were confirmed in spite of Conkling's continued opposition. Early in 1880 Senator Conkling became the leader of the movement for the nomination of General Grant for a third term in the Presidency. How much of his advocacy was due to his regard for Grant, and how much to his hostility to the other leading two candidates, Sherman, with whom he had come into conflict during Hayes's administration, and Blaine, whose bitter political and personal enemy he had been for twenty-four years, can never be known. The convention, by a combination of the Blaine and Sherman interests, nominated James A. Garfield. Conkling and the famous '306' remained faithful to Grant to the last, and were allowed to name the candidate for Vice-President. The result emphasized Conkling's hostility toward Blaine, and eventually led to the former's quarrel with Garfield and consequent retirement from political life. Immediately after Garfield's inauguration, Conkling presented to the President a list of men whom he desired to have appointed to the Federal offices in New York. Garfield's appointment of Blaine as Secretary of State, and of Windom as Secretary of the Treasury, instead of Levi P. Morton, whose appointment Conkling had urged, angered Conkling and made him unwilling to agree to any sort of compromise with Garfield on the New York appointments. Without consulting him, the President nominated for Collector at New York William H. Robertson, an anti-Conkling man. Robertson's nomination was confirmed by the Senate, in spite of the opposition of Conkling, who claimed the right of Senators to control Federal patronage in their States. Conkling and his colleague, Thomas C. Platt, immediately resigned their seats in the Senate, and appealed to the New York Legislature to justify their course by reelecting them. After an exciting canvass, Conkling and Platt were defeated, and Warner Miller and E. G. Lapham were chosen in their stead. The remainder of his life Conkling spent in the practice of law in New York City. In 1882 he was nominated by his friend, President Arthur, to succeed Ward

Hunt as an associate justice of the United States Supreme Court, but he declined. Consult: *Life and Letters*, edited by A. R. Conkling (New York, 1889).

CONN. An irresponsible, gay-spirited fellow, the leading character in Dion Boucicault's play *The Shaughran*.

CONN, HERBERT WILLIAM (1859—). An American zoölogist and bacteriologist, born at Fitchburg, Mass. He took his baccalaureate degree at the Boston University and his doctorate at Johns Hopkins University, and soon afterwards became professor of biology at Wesleyan University in Connecticut. From 1889 to 1897 he was director of the Marine Biological Laboratory at Cold Spring Harbor, L. I. He is considered an authority on the bacteriology of dairy products, in connection with which he has published many papers, usually under the auspices of the Agricultural Station at Storrs, Conn. His works include: *Evolution of To-day* (1886); *The Living World* (1891); *The Study of Germ-Life* (1897); *Classification of Dairy Bacteria* (1899); *The Method of Evolution* (1900).

CONNAUGHT, kōn'nat (Ir. *Connacht*). The northwestern and smallest of the four provinces of Ireland, bounded north and west by the Atlantic, east by Ulster and Leinster, and south by Munster (Map: Ireland, B 3). It contains the counties of Galway, Leitrim, Mayo, Roscommon, and Sligo. Area, 6867 square miles. Population, in 1841, 1,420,900; in 1891, 719,500; in 1901, 649,630.

CONNAUGHT, ARTHUR WILLIAM PATRICK ALBERT, Duke of, Prince of the United Kingdom (1850—). The third son of Queen Victoria. He entered the Military Academy at Woolwich in 1866, and in 1880 became a general of brigade. He was created Duke of Connaught and Strathern and Earl of Sussex in 1874, and took his seat in the House of Lords. In 1879 he married Princess Margaret Louise, grandniece of the German Emperor William I. He served in Egypt in 1882, became a general in 1893, and from 1893 to 1898 was in charge of the permanent camp at Aldershot. In 1896 he and his wife represented Queen Victoria at the coronation of the Czar Nicholas II. He succeeded Lord Roberts as commander-in-chief of the forces in Ireland in January, 1900, and in the following year became commander of the Third Army Corps.

CONNEAUT, kōn'né-ət'. A village on Conneaut Creek, Ashtabula County, Ohio, near the Pennsylvania line, 68 miles northeast of Cleveland, and noted as the landing-place of the first white settlers of northern Ohio in 1796 (Map: Ohio, J 2). It is on the Lake Shore and Michigan Southern; the New York, Chicago and Saint Louis; and the Pittsburg, Lake Erie and Bessemer railroads, and has a good harbor at the mouth of the creek, where there is a lighthouse. It is an important ore and coal port, and has extensive railroad shops and plants for the manufacture of canned goods, self-sealing packages, bricks, lumber, etc. Conneaut also exports large amounts of molding sand and agricultural produce. The electric-light plant is owned and operated by the village, which was incorporated in 1832. It is governed by a mayor, elected every two years, and a council. Population, in 1890, 3241; in 1900, 7133.

CONNECTICUT, kōn-nēt'ī-kūt (Algonquin *Quinnī-tuk-ut*, long river). One of the original thirteen States of the United States; a north Atlantic Coast State and the southwesternmost of the New England States (Map: United States, L 2). It is included between latitudes 40° 59' and 42° 3' N. and longitudes 71° 47' and 73° 43' W., and is bounded on the north by Massachusetts, on the east by Rhode Island, on the south by Long Island Sound, and on the west by New York. It has an extreme length from east to west of nearly 105 miles, and an average length of about 95 miles; an extreme width from north to south of 76 miles, and an average width of 57 miles, with a total area of 4990 square miles, of which 145 square miles are water surface and 4845 square miles, or 3,100,800 acres, are land. Connecticut is one of the smallest States in the Union, only two States being smaller, but it ranks twenty-ninth in population. The boundary lines between Connecticut and the adjoining States are somewhat irregular, since they depend on old grants and surveys which were very unsystematic.

TOPOGRAPHY. The highland region, which commences in Vermont in the Green Mountains and continues across Massachusetts in the Berkshire Hills, descends into Connecticut, at first with considerable height; but southward it gradually loses its mountainous character, and as Long Island Sound is approached it is represented by low hills only. In this hill country, the streams flow in most cases in narrow valleys. East of this region is the broad valley of the Connecticut, with an altitude of less than 100 feet at the north boundary of the State, and less than 500 feet over a breadth of 25 miles. The river leaves this depression at Middletown, the depression continuing southwestward to the coast at New Haven, while the river flows southeastward through a hill country to its mouth at Saybrook. The eastern part of the State is hilly, with altitudes exceeding 1000 feet near the northern boundary, and diminishing in height southward. Here also most of the streams flow in narrow, deep valleys.

In former geologic times the area of Connecticut is believed to have formed a part of the southern slope of a great mountain mass, whose summits are perhaps indicated by the present White, Green, and Adirondack mountains. Long-continued erosion of streams and perhaps of ice reduced this region to a plain, with low relief and shallow stream valleys. A comparatively recent tilting of the land has slightly depressed the coast and elevated the interior. This has revived the cutting power of the streams, which are now actively eroding their valleys, most of them in hard rocks, in which slow progress is made. The Connecticut Valley is, however, largely of relatively softer rocks, which have been eroded away with greater rapidity. In recent geologic times the area of the State was covered by the Laurentian glacier, which did much erosion and deposition, scouring out lake basins, and thus forming the multitude of little lakes and ponds which diversify the surface, and modifying the streams' courses, producing rapids and falls, now utilized for water-power.

Among the highest points in Connecticut are Bear Mountain, 2355 feet; Gridley Mountain, 2200 feet; Riga Mountain, all in Salisbury; Bradford Mountain, in Canaan, 1927; Dutton Mountain, 1620 feet, and Mount Ball, 1760, in

Norfolk; Above All Mountain, 1456, in Warren; Ivy Mountain, in Goshen, 1640 feet; and Ellsworth Hill, 1580 feet, in Sharon. The coast of Connecticut is very broken and irregular, and consists of a succession of rocky points and gravel or sandy beaches. It possesses a number of good harbors, and the larger rivers have estuary-like mouths. The coast waters are shallow, but usually deep enough to permit the near approach to land of vessels. Numerous small rocky islands skirt the shores; the largest island on this coast being Fisher's Island, off the mouth of the Thames, which, while geographically belonging to the Connecticut coast, politically belongs to New York.

The hydrography of Connecticut is simple in general outline, the streams as a whole following the slope of land from the north toward the south. Since this slope is but a continuation from the higher land to the north, the main streams rise north of the Connecticut boundary and the waters flow in a generally southerly direction across the State and empty into Long Island Sound. There are three main river systems: the Housatonic-Naugatuck in the west; the Connecticut in the middle; and the Thames in the east. The streams tributary to these main rivers are numerous, and some of them of considerable size. In the southern part of the State there are many small streams which have a southerly direction and flow straight to the Sound. The three main rivers receive the drainage of a comparatively small portion of this coast area. The small streams are in few cases more than 25 miles in length in a direct course, except the Quinnipiac, which enters New Haven Harbor, and which has its source well within the Connecticut depression. The Connecticut water-courses have in general deeply cut their path through the highlands, so that on the main streams the fall is less than might be expected from the neighboring elevations. The smaller streams, however, and the larger ones in their upper courses, furnish an enormous water-power.

CLIMATE AND SOIL. In Connecticut the average annual temperature decreases from about 50° F. on the southern coast to about 48° in the northeastern part and 46° in the northwest. In midwinter the average temperatures decrease from about 30° along the southern coast to 24° in the northern part. In all portions of the State the temperature usually descends below zero at times during the winter, and may even fall as low as -10° or -15° F. In mid-summer the average temperature is about 72° along the southern coast, but increases to 74° in the middle interior, and decreases again to about 70° in the northwest. During the summer extreme temperatures ranging from 90° to 100° F. may be expected in all parts of the State.

The prevailing winds in Connecticut are from the westward. In the winter the prevailing wind throughout most of the State is from the northwest, and in mid-summer from the southwest throughout the State. The general or prevailing southwest winds during the summer months considerably lessen the land temperatures on the southern coast and to some distance inland, while the prevailing northwest winds during the winter carry the inland cold air to the coast. The relative humidity varies from 70 to 80 per

cent., and is greater in winter and less in the spring than at other times of year. Throughout most of the State the average rainfall during the year is from 45 to 50 inches. The precipitation is quite evenly distributed over the entire year; on the average a little more than 5 inches falls during each of the spring and summer months and a little over 4 inches during each of the fall and winter months. The snowfall varies very much from year to year, but on an average for a series of years about 40 inches fall on the southern coast, and there is a rather regular increase toward the northern part of the State to 50 inches in the northeast corner and to 60 inches in the northwest corner.

The valley land of Connecticut is usually a rich alluvial deposit, which has left the hill land rather thin in soil and barren, but nevertheless still of great value for fruit, grass, and pasture. The northern part of the Connecticut River Valley, as far south as Middletown, has a rich, deep, loamy soil, often with a clay subsoil. In the southern part of the State, however, and along the coast, the soil is sandy. In the southwest there is a dark argillaceous soil, and in the northeast a light gray loam.

For flora and fauna, see paragraphs under UNITED STATES.

GEOLOGY. The great valley which extends northward from New Haven to the Massachusetts boundary is occupied by a belt 5 to 18 miles in width, of Triassic sandstone, broken through in places by trap-rocks. East and west of this valley crystalline rocks, including granite, gneiss, schist, slate, and limestone, predominate. In the northwestern part of the State these rocks are of metamorphic origin and represent the altered product of Ordovician strata, while the granite and gneiss in the eastern and southern parts probably belong to the Archaean. The whole State lies within the region of glacial drift, and a heavy mantle of sands, gravels, and boulder clay rests upon the rock formations.

MINERAL RESOURCES. Tungsten ore is mined near Long Hill, in Trumbull township, but there are no other metallic mines in operation at present, although copper, lead, and iron ores are known to occur. The granite outcrops on Long Island Sound yield a good quality of building-stone, and feldspar is produced at Branchville and South Glastonbury. Portland is noted for its quarries of brownstone (sandstone), large quantities of which have been consumed for building purposes in the large cities on the Atlantic Coast. Marble, limestone, and clay are also produced at various localities. For a long series of years Connecticut has produced granite, limestone, and sandstone in quantities varying in aggregate value from a half-million to a million dollars per annum. Connecticut contains the oldest iron-mines in the United States, the Salisbury Mine having been opened in 1732. The Connecticut mines and furnaces furnished valuable supplies of cannon-balls, shells, etc., for the Continental forces during the War of the Revolution.

FISHERIES. The State ranks third among the New England States in the value of its fisheries. Their importance has changed but little in recent years, the product remaining about constant at \$1,500,000, while the number of men engaged—2470 in 1897—has decreased as a result of improved methods. There has been a decided de-

AREA AND POPULATION OF CONNECTICUT BY COUNTIES.

County.	Map Index.	County Seat.	Area in square miles.	Population.	
				1890.	1900.
Fairfield	B 5	Bridgeport	641	150,081	184,203
Hartford	D 3	Hartford	677	147,189	195,480
Litchfield	B 3	Litchfield	931	53,542	63,672
Middlesex	E 3	Middletown.....	373	39,524	41,760
New Haven	D 4	New Haven.....	612	209,058	269,163
New London.....	G 4	New London.....	681	76,634	82,758
Tolland	F 2	Tolland.....	415	25,081	24,523
Windham	G 2	Putnam	515	45,158	46,861





crease in the menhaden and cod fisheries, so that at present the industry is almost wholly confined to oyster-fishing, the product of which was valued at \$1,250,000 in 1897. Next in importance are the lobster fisheries, with an aggregate value of \$83,700.

AGRICULTURE. With the exception of the river valleys, Connecticut soil is not favorable to agriculture. The surface is broken and stony, and generally lacks fertility. With the development of the fertile and easily cultivated plains of the West, Connecticut, in common with the other New England States, found market prices reduced below the point of profit, and its farmers were forced to give up the occupation or improve their methods of farming. Since 1850 there has been a continual decrease in the production of almost every staple crop. In 1899 the acreage of corn (47,900) was twice that of all other cereals, and it was the only cereal which did not lose in acreage during the decade. But proximity to the best markets of the country has been of great advantage to Connecticut, and this, together with improved methods of tilling the soil, particularly the extensive application of fertilizers, has saved the agricultural interests from complete ruin. Hay is by far the most extensive crop, the acreage (480,000 in 1900) being more than three times that of the total for all other crops. Tobacco ranks next to hay in importance. The cultivation of this plant was begun in 1640, if not earlier, and it is confined mostly to the valleys of the Housatonic and Connecticut rivers. The tobacco, which is of superior quality and of mild flavor, is used chiefly for wrappers for cigars made from the stronger-flavored Havana tobacco. The acreage for 1899 (10,120) was the largest for any year recorded, and though constituting but 2 per cent. of the area for all crops, returned 13.9 per cent. of the gross income. The average value of the product per acre was \$303, exceeding the corresponding figure for any other tobacco-growing State. Vegetables rank next to tobacco in value of product. The influence of the large city population of the State on agriculture has been to increase the interest in dairying and vegetable and fruit raising, for which purposes the land is well adapted. The dairy cows number about 127,000, and the dairy product for 1899 exceeded in value \$7,000,000. The production of milk increased over 30 per cent. during the decade, but this gain was somewhat offset by a decrease in the manufacture of butter and cheese. There has been a decided increase during the last decade in the number of peach orchards, but apple-trees still constitute about three-fifths of the total number of orchard trees. With the exception of dairy cows, horses are the only kind of farm stock showing an actual increase during the last half-century; swine, sheep, and meat cattle have greatly decreased. Of the total land surface of the State, 74.6 per cent. is included in its farms, and of this but 46 per cent. is improved. While the farm area has remained about constant for a number of decades, the percentage of improved land has greatly decreased, particularly during the last decade. This curious fact is explained by the increase in dairying, etc., as stated above. The average size of the farms is 86 acres. Eighty-seven per cent. of the farms are operated by their owners, and among those rented the cash-rent method predominates. The

following comparative table for the years 1890 and 1900 includes the more important varieties of crops and domestic animals:

Year	Corn	Potatoes (both kinds)	Hay and forage	Tobacco	Misc. Vege- tables
1900	(acres)	(acres)	(acres)	(acres)	(acres)
1890	47,914	27,150	478,555	10,120	11,143
	40,445	23,099	511,728	6,331	.....

Year	Dairy cows	Meat cattle	Horses	Sheep	Swine
1900	126,434	90,624	52,576	23,021	46,447
1890	127,892	75,769	43,764	37,652	62,087

MANUFACTURES. Connecticut is notably a manufacturing State, 19.5 per cent. of the total population being engaged in that industry. Though one of the smallest States of the Union, it ranks eleventh (1900) in the importance of its manufactures. Influential among the factors which have developed these interests have been the favorable geographical location and the excellence of the land and water communication of the State, the water-power afforded by its streams, and especially the inventive talents and industrious habits of its people. The proverbially ingenious Yankee is indigenous in Connecticut, and from an early day has excelled in the invention and manufacture of 'Yankee notions.' The names of Colt, Whitney, Goodyear, and Howe, among others, suggest the State's prominence in the past, while to-day more industries are protected by patents in Connecticut than in any other State; and in proportion to population the State also leads in the number of patents received.

By the Twelfth Census the State surpassed any other State in 11 important industries, producing 75 per cent. in value of the total ammunition output of the country; 56 per cent. of the brass manufactures; 63 per cent. of the clocks; 47 per cent. of the hardware; 76 per cent. of the plated and Britannia ware; 64 per cent. of the needles and pins. The development of manufactures has been steady, and the absolute gain was the greatest from 1890 to 1900, both in the number of establishments and the value of the product. In the seventeen most important industries a tendency toward centralization is evident, inasmuch as the number of establishments has increased less than 5 per cent. during the last decade, while the total product has increased over 45 per cent. In certain industries, however, quite the contrary drift is noticeable. The textile and the brass-manufacturing industries lead in importance, but the two fared differently from 1890 to 1900, the product of the former more than doubling, that of the latter increasing but slightly. The influence of the development of cotton-mills in the South is probably reflected here, the increase in the textile manufactures being in the dyeing, finishing, and silk products—branches which have not yet developed in the South. The cotton-mills of the State are clustered on the streams that flow into the Thames at Norwich. The following table shows the num-

ber of establishments, the number of wage-earners, and the gross value of the products for 1890 and 1900:

port of New York, most of the foreign trade of the State passing through that city. Although there are no exports to foreign countries direct

INDUSTRIES	Year	Number of establishments	Average number of Wage-Earners	Value of products, including custom work and repairing
Total for selected industries for State.....	1900	993	110,346	\$905,734,909
	1890	949	89,154	141,281,406
Increase, 1890 to 1900.....		44	21,192	64,453,503
Per cent. of increase.....		4.6	23.8	45.6
Per cent. of total of all industries in State.....	1900	10.9	62.5	58.3
	1890	13.9	63.4	56.9
Ammunition	1900	5	4,134	9,823,712
	1890	4	1,443	3,838,774
Brass manufactures: Total.....	1900	58	12,652	48,526,808
	1890	53	10,636	22,309,894
Clocks.....	1900	10	3,929	4,545,047
	1890	9	2,777	3,117,186
Corsets.....	1900	24	5,755	6,846,964
	1890	18	4,868	6,274,867
Cutlery and edge tools.....	1900	44	4,077	5,362,620
	1890	48	2,162	2,895,390
Foundry and machine-shop products.....	1900	260	12,646	18,991,079
	1890	193	8,643	13,314,156
Fur hats (also hats and caps, not including fur hats, and wool hats)	1900	73	5,265	8,093,072
	1890	60	6,065	7,527,017
Hardware.....	1900	63	12,056	16,301,198
	1890	70	8,108	11,995,023
Plated and Britannia ware.....	1900	26	4,491	9,538,397
	1890	21	4,159	7,569,920
Rubber and elastic goods.....	1900	22	3,006	8,246,240
	1890	16	2,245	3,476,398
Textiles: Total.....	1900	197	32,587	49,265,752
	1890	208	31,991	46,757,780
Cotton goods (including cotton small wares).....	1900	57	13,205	15,509,842
	1890	65	13,220	15,409,476
Hosiery and knit goods.....	1900	25	3,243	4,043,977
	1890	27	3,059	3,771,567
Silk and silk goods.....	1900	38	6,514	12,378,981
	1890	35	4,964	9,788,951
Woolen goods.....	1900	51	4,668	8,097,218
	1890	55	5,069	9,082,493
Worsted goods.....	1900	10	2,198	4,539,814
	1890	10	2,234	4,651,402
Other textile products.....	1900	16	2,759	4,614,920
	1890	16	3,335	4,053,891
Product of six other industries.....	1900	211	9,748	19,907,960
	1890	259	6,057	12,205,001

TRANSPORTATION AND COMMERCE. The railroad system of Connecticut reached an early development, and has been but little extended in recent years. In 1900 the total mileage was 1025, the greater part of which was owned or leased by the New York, New Haven and Hartford Company. There were 53,352,000 passengers carried during the year; the freight carried amounted to 17,393,000 tons. While railroad-building has remained for some time almost stationary, street railways, on the other hand, especially cross-country lines, show a noteworthy growth. These had in 1900 reached a total length of 500 miles, having authorized capital stock amounting to \$21,467,000. Transportation within the State is also much helped by the improvement of country roads, in which enterprise the State aids the communities.

The ports of entry are Hartford, Fairfield, New Haven, Stonington, and New London. There is a brisk coastwise trade, particularly with the

from Connecticut, there were foreign imports in 1900 amounting to about \$1,800,000, two-thirds of which entered by the port of Hartford.

GOVERNMENT. The present Constitution was approved by the people of the State in 1818. Twenty-nine amendments have since been adopted. An amendment originates in the House of Representatives, is approved by a two-thirds vote of each House at the following session, and in turn by a majority vote of the electors present at the town meetings held for its consideration. Applicants for franchise must be twenty-one years of age, must be able to read, and must have lived one year in the State and six months in the town.

Legislature.—General elections for State officers and the General Assembly are biennial, in even years, on the first Tuesday after the first Monday in November. The General Assembly consists of 24 Senators, elected from districts of contiguous territory, no town being divided or part

of a county attached to any other county, and 252 Representatives, elected from the towns, each town being permitted one or two members, according as its population is below or above 5000. But towns which had two Representatives prior to the amendment of 1874 still retain that number without regard to population. Senators and Representatives are elected for a two years' term, and receive for the regular session \$300 each and mileage. Only mileage is allowed for extra sessions. The Assembly convenes on the first Wednesday after the first Monday in January of each odd year.

Executive.—The Governor, Lieutenant-Governor, Secretary, Treasurer, and Comptroller are each elected for two years, and have their salaries fixed by law. The Governor's veto may be overcome by a majority vote of each House. The Lieutenant-Governor presides in the Senate.

Judiciary.—The judiciary consists of a supreme court of errors, with a chief justice and four associate judges; a superior court of six judges (all the foregoing are nominated by the Governor and appointed by the Assembly for eight years); courts of common pleas for Hartford, New Haven, New London, Fairfield, and Litchfield counties, each with one judge, except in New Haven County, where there are judges respectively for the civil and criminal sides; a district court in Waterbury; various city and borough courts, and justices of the peace.

Local Government.—The counties elect sheriffs who serve for a term of four years. The towns annually elect selectmen and other local officers.

State Laws.—Real estate acquired by a married woman's services, or conveyed to her for a consideration, may be held for her own use. The husband is trustee of a wife's personal estate, which upon his death falls to her or her devisees, legatees, or heirs, as though she had never been married; and married women may convey by devise the same as single persons, except that a husband (if he have not abandoned her) must unite in conveying by deed. Divorce may be had for fraudulent contract, adultery, desertion, and neglect of duty for three years, habitual intemperance, cruelty, for imprisonment for life, and for certain crimes; previous residence required, three years; either party may remarry. The sale of liquor is regulated by each town in accordance with local-option laws. The registration of voters is required in this State. Women may vote in an election for school officers. The legal rate of interest is 6 per cent. Judgments outlaw in seventeen years; notes and open accounts in six years.

Militia.—There is a total organized militia of 2774 men—infantry 2589, artillery 128—organized into one brigade and four regiments. There are 207,600 men of military age, of whom 106,500 are liable to military duty.

Finances.—The receipts for the civil-list funds during the fiscal year ending September 30, 1900, aggregated \$2,876,856 and expenditures, \$2,528,514. The largest items of expense were the common schools (\$454,652) and humane institutions (\$365,684). The largest sources of income were tax on railroads, \$975,143; tax on savings banks, \$418,780; tax on mutual life insurance companies, \$291,066; and inheritance tax, \$165,930. The total State debt, less the civil list funds, was \$2,108,873. The total indebtedness of all towns, cities, boroughs, and counties of the State was \$27,624,827, much of which was incurred in the

support of schools and in the construction of roads.

BANKS. On October 31, 1900, there were 103 national banks within the State, 84 of which were in active operation. The capital stock aggregated \$20,546,000; circulation outstanding, \$10,390,000. On September 5, 1900, the deposits amounted to \$44,304,000 and the reserve, \$12,933,000. On October 1, 1900, there were eight State banks, with resources amounting to \$10,279,000; capital, \$2,340,000; deposits, \$6,937,279; and 14 trust companies doing a banking business, whose total resources aggregated \$11,408,583; capital, \$1,775,000; and deposits, \$8,484,690. There were also 89 savings banks, with 410,342 depositors and \$183,781,000 deposited.

POPULATION. Population, in 1637, 800; in 1688, 17,000; in 1755, 133,000—3500 slaves; in 1787, 202,000; in 1800, 251,002; in 1840, 309,978; in 1860, 460,147; in 1890, 746,258; in 1900, 908,420. It will be seen that the absolute increase during the last decade exceeds that of any previous decade. Almost two-thirds of this increase was among native whites of foreign-born parents. This class, together with the foreign-born (238,210), constitutes almost three-fifths of the total population. Of the latter class, almost half came from Ireland, the next most important nationalities being Germans, English, and Canadians. For several decades the large emigration of the male population to the West resulted in an excess of females within the State; but the 1900 census shows that the sexes are almost equal in number.

Being of a manufacturing State, the population shows a strong tendency to congregate in the cities. In 1900, 53 per cent. of the population was in cities of over 8000 population. According to the census of 1900, New Haven had 108,027 inhabitants; Hartford, 79,850; Bridgeport, 70,996; Waterbury, 45,859; and New Britain, 25,998. Hartford is the capital. The State has five representatives in the Lower House of Congress.

EDUCATION. Connecticut has always been one of the leading States in educational matters. From the earliest colonial period primary education was provided for at the public expense, and the establishment of Yale University in 1701 afforded opportunities for higher instruction. For more than a decade before 1901 the school term exceeded 180 days, although the average for the whole country is only 134 days. Almost five-sixths of the school population attend the public schools, and in 1900, 94 per cent. of all children between the ages of four and sixteen were registered in some school. The expense of education per registered student was \$17.58. For the twenty-five-year period 1875-99 the school expenditure was drawn from the following sources: permanent funds, 7.8 per cent.; State taxation, 14 per cent.; local taxation, 67.7 per cent.; and other sources, 10.5 per cent. There were 4079 public-school teachers, of which but 9 per cent. were males. There are 77 public high schools and three normal schools. School districts not having high schools must pay the tuition for such students as may wish to attend the high school of some other school district. The administration is vested in a board of education, or town committee, or board of school visitors, while the general educational supervision of the State is in the hands of a State Board of Education.

There is no State university. The chief higher educational institutions are Yale University, non-sectarian, though historically affiliated with the Congregationalists; Wesleyan University (Methodist Episcopal), at Middletown, for both sexes; Trinity College (Protestant Episcopal), at Hartford. Schools of science, law, art, and medicine form departments of Yale University. The Congregationalists have divinity schools at New Haven and Hartford; the Protestant Episcopalians, one at Middletown; and the Baptists, a literary institute at Soufield. There are an agricultural college at Mansfield and training schools for nurses at Hartford and New Haven.

CHARITABLE AND PENAL INSTITUTIONS. The State has a large number of charitable and penal institutions. The humane institutions alone cost in 1900 \$365,000, and the correctional institutions and soldiers' homes, over \$300,000, the combined amounts being much greater than the amount which the State government annually expends upon the public schools. There are a State prison at Wethersfield; an industrial school for girls at Middletown; a school for boys at Meriden; a hospital for the insane at Middletown; a school for imbeciles at Lakeville; a retreat for the insane at Hartford; and Fitch's home for soldiers at Noroton. Besides these, there are 10 private sanatoriums for nervous and mental diseases; 2 institutions for the deaf; 1 institution for the blind; 21 hospitals, 8 county temporary homes, 16 homes for the aged, and 16 children's homes. In general, Connecticut has assumed an enlightened and progressive policy in the administration of her charitable and correctional affairs. There is a State Board of Charities, consisting of five members, appointed by the Governor for a term of four years. Its powers are largely advisory, being authorized to visit and inspect all institutions, public or private. It embodies some of the functions of a prison commission and of a lunacy commission, and may correct any abuses, providing that this is done in such a manner as not to conflict with any personal, corporate, or statutory rights. The members of the board receive no remuneration; their actual expenses are paid. The policy has been adopted of placing in private families children committed to the reformatory schools, as well as orphans. The State has no reformatory for cases of 'first offense' committed between the ages of sixteen and thirty.

RELIGION. Connecticut was in its early days a refuge for the English Nonconformists, and soon became a Puritanical stronghold. For a long time the Congregational Church had almost the entire field to itself. The Unitarian movement made less progress in Connecticut than in other New England States. With the emigration to Western States of large numbers of the descendants of the original Colonial stock and the incoming of large numbers of foreigners—especially Irish and French-Canadian—a still greater religious change has taken place, and the Catholic Church now numbers more than half of the church-membership of the State.

HISTORY. In 1614 Adrian Block, a native of Holland, discovered and explored the Connecticut River, but it was not till 1633 that the Dutch of New Amsterdam began a trading post at Suckiaug (Hartford). Two years earlier the soil from Narragansett Bay to the Pacific Ocean was granted by the Earl of Warwick to Lord Say and

Sele, and others, but the transfer apparently had no legal basis. In 1633 traders from Plymouth visited the site of Windsor, Wethersfield in 1634, and Windsor and Hartford in the following year, were settled by emigrants from Massachusetts Bay. In 1635 the Say and Sele patentees sent over John Winthrop, Jr., to act as Governor. He built a fort at Saybrook, preventing the Dutch from getting control of the Connecticut, and gave the settlers in the upper valley a conditional permission to remain. Desire for a more democratic government caused a new exodus from Massachusetts, and in 1636 Hartford, Windsor, and Wethersfield received their chief bodies of immigrants. In 1638-39 the three towns united in an independent commonwealth and adopted a thoroughly democratic constitution. The Massachusetts system of town government, transplanted to Connecticut, attained its fullest development in the three upper settlements, with which Springfield (Agawam) remained nominally associated till 1641. War with the Pequots, the most powerful of the Indian tribes, in 1637, led to their extermination, and the progress of colonization was never again hindered by the enmity of the natives. In 1638 New Haven was founded by a Puritan colony under the Rev. John Davenport, and from 1638 to 1640 Milford, Guilford, and Stamford on the mainland and Southold on Long Island were settled. Together with Branford these towns were united, between 1643 and 1651, into one 'jurisdiction,' known subsequently as the New Haven Colony, as opposed to the upper settlements, which constituted the Connecticut Colony. The laws of the Old Testament were made the rule for all courts. A somewhat similar code of laws in Connecticut gave rise in after years to the nickname 'blue laws' (q.v.), although Connecticut, unlike New Haven, did not restrict the franchise and the holding of office to church members. In 1644 Connecticut bought the colony of Saybrook from Say and Sele, and gradually (1644-62), by purchase and colonization, acquired the greater part of the present State and a considerable portion of Long Island. In 1657 John Winthrop, Jr., was chosen Governor of Connecticut, and by his skill in diplomacy procured, in 1662, a charter from Charles II. granting absolute autonomy to that Colony. By this charter New Haven was incorporated with Connecticut, in spite of the most vehement opposition on the part of the former. New Haven, nevertheless, was forced to submit (1664). In October, 1687, Sir Edmund Andros came to Hartford and demanded the charter from the General Assembly, but it was carried away and secreted till 1689. (See CHARTER OAK.) From 1687 to 1689, however, the Colony was subject to the despotic rule of Andros. In 1708 the Congregational Church system was established by the adoption of the Saybrook platform, and this was supplemented by the Act of 1742. Though other denominations were tolerated, Church and State for a long time remained closely connected, and secular and religious affairs were under the control of the same authorities. In 1754 Connecticut bought from the Indians a large tract of land in the Wyoming Valley in Pennsylvania and proceeded to settle it, but was compelled in 1782 to surrender it to Pennsylvania. In 1786 the Colony relinquished its charter rights to the territory west of its present

limits and received in return the Western Reserve (q.v.). Emigration to the western lands, as well as to Vermont and New York, was active.

The passage of the Stamp Act was vigorously denounced by the General Assembly; in May, 1776 the Colony was declared released from its allegiance to England, and in October Connecticut was constituted an independent State. It contributed more than 30,000 men to the Revolutionary Army, and its Governor, Jonathan Trumbull, was one of Washington's most trusted advisers. In 1777 the British burned Danbury, and in 1779 pillaged New Haven. Forts Griswold and Trumbull, at New London, were taken on September 6, 1781, by Benedict Arnold, and the town was destroyed. In the framing of the Federal Constitution Connecticut took a prominent part, and to its delegates was due the adoption of that feature of the Constitution which provides for State representation in the Upper House of Congress and proportionate representation in the Lower. Connecticut was always a stronghold of federalism; it strongly opposed the War of 1812, and its Capitol was the meeting-place of the celebrated Hartford Convention (q.v.). In 1818 a new constitution was framed, Church and State were separated, and the franchise was widely extended. The General Assembly was divided into a Senate and a House of Representatives. The conservative and theoretic character of the government became greatly modified as the State developed from an agricultural region into a commercial and industrial centre. The shrewdness of the Connecticut trader and the preëminent ingenuity of the Connecticut mechanic raised the State to a high degree of prosperity. During the Civil War Connecticut gave to the Union cause nearly 60,000 troops and the services of her great War Governor, Buckingham. Progress was rapid after the war. In the matter of public instruction the State took one of the foremost places in the Union, if not the foremost, devoting the entire proceeds from the sale of its public lands to the support of the free schools. In the readjustment, however, of the balance of political power in conformity with changed political conditions, no like spirit of progress was shown, and in 1901 the necessity of electoral reform was discussed at length in the press of the State. Representation in the Lower House being based on the old township divisions and not on population, it happened that great cities like New Haven and Bridgeport were dominated by rural communities with one-tenth their population. In many cases, a state of things prevailed not far removed from conditions in England before the Reform Bill of 1832. The agitation resulted in the calling of a constitutional convention, which met in January, 1902, and drew up a scheme of redistribution which was submitted to the people on June 16. The measure provided for one representative from every town with a population of less than 2000, two representatives for towns between 20,000 and 50,000, three for towns between 50,000 and 100,000, and four for all cities over 100,000, with one additional for every 50,000 inhabitants above that number. The effect of the measure would have been to deprive some towns of one representative each and to assign these to the large towns. The plan, however, satisfied neither the conservatives nor the advocates of reform, and was voted down. In national elections, Con-

necticut has been in general Federalist, Whig, and Republican; but it cast its vote for Monroe in 1820, for Van Buren in 1836, for Pierce in 1852, for Tilden in 1876, and for Cleveland in 1884, 1888, and 1892. In State elections it is doubtful.

COLONIAL GOVERNORS

Connecticut Colony

Years		Years	
John Haynes.....	1639-40	John Webster.....	1656-57
Edward Hopkins.....	1640-41	John Winthrop.....	1657-58
John Haynes.....	1641-42	Thomas Welles.....	1658-59
George Wyllys.....	1642-43	John Winthrop.....	1659-76
John Haynes.....	1643-44	William Leete.....	1676-83
Edward Hopkins.....	1644-45	Robert Treat.....	1683-87
John Haynes.....	1645-46	Edmund Andros.....	1687-89
Edward Hopkins.....	1646-47	Robert Treat.....	1689-98
John Haynes.....	1647-48	Fitz John Winthrop.....	1698-1707
Edward Hopkins.....	1648-49	Gurdon Saltonstall.....	1707-24
John Haynes.....	1649-50	Joseph Talcott.....	1724-41
Edward Hopkins.....	1650-51	Jonathan Law.....	1741-50
John Haynes.....	1651-52	Roger Wolcott.....	1750-54
Edward Hopkins.....	1652-53	Thomas Fitch.....	1754-66
John Haynes.....	1653-54	William Pitkin.....	1766-69
Edward Hopkins.....	1654-55	Jonathan Trumbull.....	1769-76
Thomas Welles.....	1655-56		

New Haven Colony

Years		Years	
Theophilus Eaton.....	1639-57	William Leete.....	1661-65
Francis Newman.....	1658-60		

STATE GOVERNORS

	Years
Jonathan Trumbull.....	Federalist..... 1776-84
Matthew Griswold.....	"..... 1784-86
Samuel Huntington.....	"..... 1786-96
Oliver Wolcott.....	"..... 1796-98
Jonathan Trumbull.....	"..... 1798-1809
John Treadwell.....	"..... 1809-11
Roger Griswold.....	"..... 1811-13
John Cotton Smith.....	"..... 1813-17
Oliver Wolcott.....	"..... 1817-27
Gideon Tomlinson.....	"..... 1827-31
John S. Peters.....	Whig..... 1831-33
H. W. Edwards.....	Democrat..... 1833-34
Samuel A. Foote.....	Whig..... 1834-35
H. W. Edwards.....	Democrat..... 1835-38
W. W. Ellsworth.....	Whig..... 1838-42
C. F. Cleveland.....	Democrat..... 1842-44
Roger W. Baldwin.....	Whig..... 1844-46
Clark Bissel.....	"..... 1846-49
Joseph Trumbull.....	"..... 1849-50
Thomas H. Seymour.....	Democrat..... 1850-54
Henry Dutton.....	Whig..... 1854-55
W. T. Minor.....	Know-Nothing..... 1855-57
A. D. Holley.....	Whig..... 1857-58
W. A. Buckingham.....	Republican..... 1858-66
Joseph R. Hawley.....	"..... 1866-67
James E. English.....	Democrat..... 1867-69
Marshall Jewell.....	Republican..... 1869-70
James E. English.....	Democrat..... 1870-71
Marshall Jewell.....	Republican..... 1871-73
Charles R. Ingersoll.....	Democrat..... 1873-76
R. D. Hubbard.....	"..... 1876-79
C. B. Andrews.....	Republican..... 1879-81
H. B. Bigelow.....	"..... 1881-83
Thomas M. Waller.....	Democrat..... 1883-85
Henry B. Harrison.....	Republican..... 1885-87
Phineas C. Lounsbury.....	"..... 1887-89
Morgan G. Bulkeley.....	"..... 1889-93
Luzon B. Morris.....	Democrat..... 1893-95
Vincent O. Coffin.....	Republican..... 1895-97
Lorain A. Cooke.....	"..... 1897-99
George E. Lounsbury.....	"..... 1899-1901
George P. McLean.....	"..... 1901-03

Consult: Dwight, *History of Connecticut* (New York, 1841); Holister, *The History of Connecticut* (New Haven, 1855); Trumbull, *The Colonial Records of Connecticut* (Hartford, 1850-59); Levermore, *The Republic of New Haven* (Baltimore, 1886); Johnston, *Connecticut* (Boston, 1887), which contains a bibliography.

CONNECTICUT LAKES. A chain of four lakes in Coos County, N. H. (Map: New Hampshire, J 1). The 'First' or Connecticut Lake is five miles long, four miles wide, and 1619 feet above the sea. Four miles northeast is the 'Second' Lake, two and three-quarter miles long,

one mile wide, and 1882 feet above the sea. The 'Third' Lake, about seven miles farther north and one-half mile from the Canadian boundary, is 2038 feet above the sea. 'Fourth' Lake, a mere pond, the last of the chain and the source of the Connecticut River (q.v.), is northwest of the 'Third' Lake, near the Canadian boundary line, and about 2550 feet above the sea.

CONNECTICUT RIVER. A river of the United States, rising in the beautiful Connecticut Lakes (q.v.), in northern New Hampshire, 2551 feet above the sea (Map: Connecticut, F 4). It flows southwest and south, forming the boundary between New Hampshire and Vermont, and enters Massachusetts near South Vernon, Vt. From this point it continues nearly due south across the State and enters Connecticut, where at Middletown it turns toward the southeast, and, completing its course across the State, empties into Long Island Sound. The Connecticut River, the longest in New England, is 375 miles long and drains an area estimated at 11,269 square miles; in the lower part of its course it is over 1000 feet wide. Its mean discharge at Hartford is about 19,000 cubic feet per second. It is navigable to Hartford, 49.5 miles, for large steamers, and by means of the Windsor locks small boats may ascend to Holyoke; the tide ascends to a point a few miles above Hartford. The river falls rapidly at places and furnishes extensive water-power. The principal falls and their heights are: Holyoke, 59 feet; Turner's 41 feet; Bellows Falls, 54.5 feet; Olcott, 36 feet; and the Fifteen-Mile Falls. The principal tributaries from the west are the Nulhegan, Passumpsic, Wells, White, Black, West, Deerfield, Westfield, Farmington, and Little River, and those from the east are the Upper Ammonoosac, Lower Ammonoosac, Ashuelot, Millers, Chicopee, Scantic, and Salmon rivers. The chief towns on its course are Wells River, Bellows Falls, Walpole, Brattleboro, Greenfield, Northampton, Holyoke, Chicopee, Springfield, Hartford, and Middletown.

CONNECTIVE TISSUE. The most widely distributed tissue of the body. It originates in the middle or mesoblastic layer of the embryo, and the differentiation which occurs and which distinguishes the different forms of connective tissue takes place mainly in the intercellular substance. Thus the intercellular substance may be soft and gelatinous, as in mucous connective tissue, or dense and firm, as in fascia and tendon, or hard, as in bone. The cells of connective tissue begin as small round mesoblastic cells. Either directly from these cells or under their influence, there is formed between the cells an intercellular substance, which, as stated, varies in character, and during the formation of which various changes take place in the cells themselves.

The principal types of connective tissue are as follows: (1) White fibrous connective tissue. (2) Yellow elastic connective tissue. (3) Developmental forms of connective tissue, (a) mucous and (b) embryonal. (4) Cartilage. (5) Bone and dentine. (6) Adipose tissue or fat. (7) Neuroglia, the connective tissue of the nervous system. Of these forms of connective tissue, fat, cartilage, bone, and neuroglia (see NERVOUS SYSTEM) represent the more highly specialized types and will be found described in articles under

their respective names. The remaining represent those forms of connective tissue to which the term usually refers. *White Fibrous Connective Tissue.*—This constitutes the subcutaneous connective tissue and intermuscular septa, where it is known as areolar tissue; it also forms the ligaments, tendons, and the framework of all the organs. Its cellular elements consist of fixed connective-tissue cells and the so-called wandering cells. The fixed cells are mainly irregular or fusiform in shape, with very little cell-body. Much less numerous are the so-called plasma cells of Waldeyer and the granule cells. Some connective-tissue cells, such as many of those found in the choroid coat of the eye, are densely pigmented. The wandering connective-tissue cells are probably identical with the white blood-corpuscles. (See BLOOD.) In the intercellular substance two kinds of fibres are found, white fibres and yellow elastic fibres. The former occur in broad wavy bundles composed of minute fibrils; the elastic fibres are narrow, glistening, apparently homogeneous bands which branch and anastomose. There is much variation in the relative number of cells and fibres, the softer tissues being more cellular, the more dense tissues, such as tendon, being almost entirely composed of fibres. *Yellow Elastic Tissue.*—This may occur almost pure in some parts of the body, as in the *ligamentum nuchæ*. (See NECK.) In such tissue, instead of the fine delicate fibres described above, the fibres are large and coarse. *The Developmental Forms of Connective Tissue.*—The mucous tissue constitutes the Wharton's jelly of the umbilical cord, the embryonal connective tissue found in fetal life. In mucous tissue the cells are stellate, with long branching processes which anastomose with those of other cells. The intercellular substance is gelatinous, with only a few fibres.

CONNELLY, WILLIAM ELSEY (1855—). An American author, born in Johnson County, Ky. He became the director of the Kansas State Historical Society and is the author of numerous publications on the early history of Kansas, Indian traditions and folk-lore, and kindred topics. Among these are: *Wyandot Folk-Lore* (1899); *Kansas Territorial Governors* (1900); *John Brown, the Story of the Last of the Puritans* (1900). He was greatly assisted in his researches by his knowledge of the Indian languages, as exemplified in his publication of a vocabulary of the Wyandot tongue.

CONNELLSVILLE. A borough in Fayette County, Pa., 60 miles southeast of Pittsburg; on the Youghiogheny River and on the Baltimore and Ohio and the Pennsylvania railroads (Map: Pennsylvania, B 3). It is the centre of the Connelville coke region, the most important seat of coke production in the United States. According to the census of 1900, the Connelville coke industry represented a capital investment of nearly \$15,000,000, giving employment to over 7000 persons, and produced more than one-half of the total coke output of the United States, and over three-fourths of that of Pennsylvania. The borough contains also machine-shops, tin-plate and automobile works, steam-pump factory, etc. It has a park, fine municipal and public library buildings, and is the seat of a State hospital. Settled in 1770, Connelville was erected into a township and named (in honor of Zachariah Connell, the founder) in 1793, and was incorpo-

rated as a borough in 1806. It is governed by a mayor, who holds office for three years, and a common council. Population, in 1890, 5629; in 1900, 7160.

CONNEMARA, kōn'nē-mā'rā (Ir. *Connac-ne-mara*, sea-side of the descendants of Connae, the second of the three sons of Maeve, the English Mab, reputed Queen of Connaught in the first century A.D.). A district, 30 miles long by 15 to 20 broad, in the west of Galway, Ireland, between the bays of Kilkieran and Ballinakill. The name is often applied to the whole western part of County Galway (Map: Ireland, B 3). It affords good angling and cycling, and is an interesting field for geologists and botanists. Building-stone and a green variety of marble, well adapted for decorative work, are extensively quarried.

CON'NER, DAVID (1792-1856). A United States naval officer, born in Pennsylvania. He entered the United States Navy as a midshipman in 1809, and during the war of 1812 served as lieutenant on the *Hornet* in her engagements with the *Peacock* and the *Penguin*. He became commodore of the West India and home squadron in 1843, and, at the outbreak of the Mexican War blockaded the Gulf ports. In his flagship, the *Raritan*, he led the attack on Vera Cruz in 1847 (see *VERA CRUZ, CAPTURE OF*) and landed General Scott's army of invasion. Commodore Conner was the first United States naval officer to use steamships in warfare. He was commandant of the Philadelphia Navy-yard at the time of his death.

CON'NERSVILLE. A city and county-seat of Fayette County, Ind., 60 miles east by south of Indianapolis; on the White Water River and on the Cincinnati, Hamilton and Indianapolis, and other railroads (Map: Indiana, D 3). It manufactures blowers, carriages, buggy springs and bodies, axles, wheels, mirrors, furniture, triple signs, overalls, flour, etc. The city has a public library and owns and operates its water-works. Connersville was incorporated in 1813, and is now governed under a charter of 1869, as revised, which provides for a mayor elected every two years, and a city council. Population, in 1890, 4548; in 1900, 6836.

CONNOISSEUR, kōn'nīs-sēr' or -sōōr' (Fr., one who knows). A person who, without being an artist, is supposed to possess a discriminating knowledge of the merits of works of art. Such persons are called by the Italians *cognoscenti*. See *DILETTANTE*.

CONNOISSEUR, THE. A weekly publication conducted by George Colman the Elder and Bonnel Thornton, from the early part of 1754 to 1756. In it the first published work of William Cowper appeared, entitled *Keeping a Secret*.

CON'NOR, SELDEN (1839—). An American soldier. He was born in Fairfield, Maine, and in 1859 graduated at Tufts College. At the beginning of the Civil War, he enlisted in the First Vermont Volunteers, but later joined the Nineteenth Maine Volunteers, of which he became colonel, and was severely wounded in the battle of the Wilderness. In 1864 he was commissioned brigadier-general of volunteers, but in 1866 was mustered out of service. He was Governor of Maine in 1876-78. Subsequently he was United States pension agent (1882-86), in 1890 became president of the Society of the Army of the Po-

tomac, in 1896-99 was senior vice-commander-in-chief of the Order of the Loyal Legion, and in 1897 was again appointed pension agent.

CONNOTATION (from Lat. *connotare*, to connote, from *com-*, together + *notare*, to note, from *nota*, mark, from *noscere*, to know; connected with Gk. *γινώσκειν*, *gignōskein*, Skt. *jñā*, Engl. *know*) OF A TERM. In logic, the quality or totality of qualities an object must possess in order to be appropriately designated by a given term. Thus, the connotation of the term 'animal' consists of all those qualities (organized physical constitution, sensitiveness, etc.) which any object must possess if it is properly to be called an animal. Synonyms of connotation are intension, comprehension, depth. (See *DENOTATION*.) A *connotative term* is one which has a connotation, and is said to *connote* the qualities by virtue of which objects have a right to be designated by the term, and to *denote* the objects possessing these qualities.

CO'NODONTS (from Gk. *κῶνος*, *kōnos*, cone + *ὀδούς*, *odous*, tooth). Minute fossil teeth of uncertain affinities, found in rocks of Ordovician to Permian age of North America and Europe. They are very small, shining objects, with more or less extended bases, from which arise one or many slender, sharp, short or long denticles. They thus vary in form from conical to pectinate according to the number and length of the denticles. The material of which they consist is red, brown, or white calcite or phosphate of lime. Associated with the tooth-like forms are minute plates of the same material, that probably belonged to the same organisms. Conodonts were first described by Pander, in 1856, from the lowest fossiliferous (Cambrian) rocks of Russia, and were by him regarded as fish-teeth. Since then they have been found in England, the United States, and Canada, and various opinions have been expressed regarding their affinities. Newberry described a number from the Carboniferous shales of Ohio, and compared them to the teeth of myxinoïd fishes. Other authors have considered them to be the spines of crustacea or the lingual teeth of naked mollusks. These opinions are all less well supported by facts than is that of Zittel and Rohon, that conodonts are the teeth of annelids allied to the Nereide. In the same rocks with conodonts are often found jaws of annelids, described as *Prioniodus*, *Polygnathus*, etc. Consult: Pander, *Monographie der fossilen Fische des silurischen Systems* (Saint Petersburg, 1856); Hinde, "On Conodonts from the Chazy and Cincinnati Groups," etc. *Quarterly Journal Geological Society*, vol. xxxv. London, 1879; Newberry, *Paleontology of Ohio*, vol. ii. (Columbus, Ohio, 1875); Zittel and Rohon, "Ueber Conodonten," *Sitzungsberichte der königlich-bayerischen Akademie der Wissenschaften* (Munich, 1886). See *WORM*, *FOSSIL*; *ANNULATA*.

CO'NOID (Gk. *κωνοειδής*, *kōnoeidēs*, cone-shaped, from *κῶνος*, *kōnos*, cone + *εἶδος*, *eidōs*, shape). A conoidal surface is a surface generated by the motion of a straight line which always meets a fixed straight line, is parallel to a fixed plane, and obeys some other law. The surface is called a right conoid when the fixed plane is perpendicular to the fixed line. It was formerly used to designate quadrics of revolution, as the surfaces of paraboloids, ellipsoids, and hyperboloids. Cones, cylinders, and conoids are

special forms of ruled surfaces. Wallis (1663) effected the cubature of a conoid with horizontal directing plane, whose generatrix intersects a vertical directing straight line and vertical directing circle.

CON'OLLY, JOHN (1794-1866). An English alienist. He was born at Market Rasen, Lincolnshire, and studied medicine at the University of Edinburgh. In 1839 he became director of the Middlesex Asylum at Hanwell. Immediately after his installation, he abolished all the devices theretofore employed to confine and restrain the insane by means of strait-jackets, straps, and similar appliances. During the period in which he was connected with the institution (1839-1851) he succeeded in completely revolutionizing the treatment of mental disease, and his so-called "no restraint system" found rapid extension everywhere. Among his principal works may be mentioned: *The Treatment of the Insane Without Mechanical Restraints* (1856); *Construction and Government of Lunatic Asylums* (1847); *Essay on Hamlet* (1863).

CON'NON (Lat., from Gk. Κόνων, Κονών). A distinguished Athenian commander. He first came into prominence in B.C. 413, when he was chosen admiral for the year. In B.C. 407 he was appointed general to succeed Alcibiades, but was defeated by Callicratidas at Mitylene. In B.C. 405 he was defeated by Lysander at Egospotami, but succeeded in escaping with eight ships to Cyprus. In B.C. 394 he commanded the combined fleets of Persia and Athens which defeated the Spartans at Cnidus. He afterwards rebuilt the Long Walls of Athens, and was, in B.C. 392, sent as envoy to the Persian Tiribazus, by whom he was thrown into prison. He died, according to the more probable account, at the court of Evagoras in Cyprus.

CON'NOSCOPE (from Gk. κώνος, κώνος, cone + σκοπεῖν, σκοπεῖν, to view). A polariscope adapted to the study of crystals, having a revolving stage for regulating the position of the crystal section under examination, two Nicol's prisms (polarizer and analyzer) for production of double polarized light, a strongly convergent lens system below the stage to cause the light to enter the crystal in a cone of rays, and a similar system above the stage to correct the divergence of the rays, so that the eye may focus them for the retina. A conoscope is chiefly used to examine the so-called interference figures of crystals. The mineralogical or petrological microscope is constructed so as to be used either as a stauroscope or a conoscope. See POLARISCOPE.

CONQUEROR, THE. A surname popularly given to William, Duke of Normandy, on becoming King of England.

CONQUEST (from OF. *conquēste*, Fr. *conquête*, Sp., Port., It. *conquista*, from ML. *conquista*, conquest, from Lat. *conquirere*, to procure, from *com-*, together + *quarere*, to seek). The forcible extension of sovereignty by one State over the territory of another as the result of successful war. Though it is denied by advocates of natural justice that this carries with it inherent rights of appropriation in territory, and destruction of national life, conquest has been one of the strongest agencies in molding civilization, and, in its influence upon the relationship of nations, it belongs to the realm of international law as well as to that of history.

Military conquest is developed from mere occupation of territory when the victorious State exercises continuously sovereign powers over the section affected, and such conquest is deemed to be completed in the legal sense by the conqueror's signifying by some formal act his intention of adding it to his dominions, such as the publication of a diplomatic circular or a proclamation of annexation. The conditions justifying such acquisition and insuring immunity from interference by other States are: (1) A situation where, in order to redress a wrong or in self-protection, it becomes necessary to strip an aggressor of a portion of his territory. (2) The completion by treaty of the title which possession by conquest has given. (3) A general acquiescence in the act of the conqueror by neutral States. The changes in the map of Europe wrought by Napoleon's conquests and annexations were not accepted by the nations affected, and, by the Congress of Vienna, a return to the original conditions was made.

Title by conquest is, in principle, to be distinguished from title by cession, by the fact that, whether ratified by treaty or not, title by conquest rests avowedly on force, whereas the cession of territory is, in theory at least, always a voluntary act on the part of the ceding power. Thus, the acquisition of Porto Rico by the United States, as the result of the late war with Spain, was due to its conquest by the military and naval forces of the United States, while the acquisition of the Philippine Islands was disguised as a voluntary cession thereof by Spain. Indeed, it is usual for conquering nations in modern times to require as a condition of peace that the defeated nation shall recognize the title of the former to the conquered territory by a treaty of cession. The title is then, in legal theory, referred to the cession, rather than to the act of conquest upon which it is really based.

Unless otherwise defined by treaty, the following rules govern the status of property and of the inhabitants of conquered territory: All public property passes to the conqueror absolutely. Except in the case of rebellion, private property rights remain undisturbed, and the conqueror is bound to make laws to insure the enjoyment of such rights, appropriate to the new political system imposed. Political laws and systems, being based upon reciprocal relations between citizens and the body politic, are destroyed, and, in the absence of treaty stipulations, political and civil rights of the inhabitants depend upon the provisions of the new régime. Absolute allegiance is due the conqueror, and, on bare conquest, he may forbid emigration from the country, but not in case of cession. Municipal laws regulating the private relations of individuals are not abrogated, however, but continue in force by the implied acquiescence of the new sovereign, until superseded by new enactments.

Difficult problems arise in determining the conflicting claims caused by the temporary exercise of sovereign powers by a conqueror. A famous example is Hesse-Cassel, overrun by Napoleon's troops in 1806, and later annexed by him to the Kingdom of Westphalia. When the Elector returned under the Treaty of Vienna, he refused to respect payments made by the public debtors and the sale of the Crown lands by Jerome Bonaparte. After passing before several tribunals, it was finally decided that the Elector's reinstatement

ment was not a continuation of his former sovereignty, and that the acts of the conqueror were valid. Consult: Lawrence, *Principles of International Law* (London and New York, 1897), and also the authorities referred to under INTERNATIONAL LAW. See ALLEGIANCE; CESSION; CITIZEN; TITLE.

CONQUEST, IDA. An American actress, who made her debut at the Tremont Theatre, Boston, in 1892, with Alexander Salvini, in a performance of *Rohan the Silent*. She is the daughter of a merchant of Boston, where she pursued her dramatic studies, and, when a child, played the part of Little Buttercup in *Pinafore*, at the Boston Museum. She has since appeared in a number of successful pieces, among them *The Charity Ball* and *Americans Abroad*, under Daniel Frohman's management; *Liberty Hall* and *Under the Red Robe*, with the Empire Theatre Company, which she joined in 1895; *Too Much Johnson*, in which she played with William Gillette in London, and Gillette's *Because She Loved Him So*, produced in Boston in 1898. In 1901 she appeared with John Drew in *The Second in Command*. Consult Strang, *Famous Actresses of the Day in America* (Boston, 1899).

CONQUEST OF GRANADA, grā-nā'dā, THE. (1) A tragedy by Dryden (1672), also called *Almanzor and Almahyde*. (2) A brilliant historical sketch by Washington Irving (1829) of the taking of Granada by Ferdinand and Isabella of Spain.

CONQUEST OF MEXICO, THE. A noted historical work by W. H. Prescott (1843), containing the life of Hernando Cortes and an account of ancient Mexican civilization.

CONQUEST OF PERU, THE. An historical work by W. H. Prescott (1847) containing an account of the Incas and their civilization.

CONQUISTADORES, kōn-kēs'tā-nō'rās (Sp., conquerors). A collective term for the Spanish conquerors of America, such as Cortes, Almagro, and Pizarro.

CONRAD I. (? -918). King of the Germans from 911 to 918. He was the son of Conrad, Duke of Franconia, and the grandson of the Emperor Arnulf. On the extinction of the direct line of the Carolingians, the Germans determined to make the sovereign dignity elective, but preferred to choose one who was related to the late imperial family, and elected Conrad in 911. He was supported by the Church, but could not command the obedience of the great dukes who were almost independent. He died December 23, 918, and was buried at Fulda. On his death-bed he enjoined his brother to carry the royal insignia to his mortal enemy, Duke Henry of Saxony, with whom he had been continually at war since A.D. 912. Consult: Stein, *Geschichte des Königs Konrad I.* (Nördlingen, 1872); Dümmler, *Geschichte des ostfränkischen Reiches*, vol. ii. (Leipzig, 1887).

CONRAD II. (c.990-1039). King of the Germans and Roman Emperor from 1024 to 1039, known as the Salic. He was the son of Henry, Duke of Franconia, and was elected King of the Germans in 1024, after the extinction of the Saxon imperial line, becoming the founder of the Franconian dynasty. Immediately after his election he commenced a tour through Germany for the purpose of administering justice.

To ameliorate the condition of his subjects, he instituted the Truce of God (q.v.). In 1026 he crossed the Alps, chastised the rebellious Italians, was crowned at Milan as King of Italy, and in the following year was anointed Emperor of the Romans by the Pope. He was soon recalled to Germany by the outbreak of formidable revolts, which he succeeded in suppressing. In 1032 he annexed the Arletan territories to the Empire. In 1036 a rebellion in Italy again compelled him to cross the Alps; but his efforts to restore his authority were this time unsuccessful, and he was forced to grant various privileges to his Italian subjects. Shortly after his return he died, at Utrecht, June 3, 1039. Conrad was one of the most remarkable of the earlier monarchs of Germany. He repressed the power of the great feudal nobles, and, by keeping the great duchies in his own family, strengthened the position of the Crown. Consult Bresslau, *Jahrbücher des deutschen Reiches unter Konrad II.* (Leipzig, 1879-84).

CONRAD III. (1093-1152). King of the Germans from 1138 to 1152. He was the son of Frederick of Swabia, and the founder of the Hohenstaufen (q.v.) dynasty. Conrad, with his elder brother, Frederick, supported Henry V. against his enemies, and in return that monarch granted Conrad the investiture of the Duchy of Franconia. He subsequently contested the crown of Italy with the Emperor Lothair of Saxony, but without success. On the death of Lothair the princes of Germany, fearing the increasing preponderance of the Guelph party, and attracted by Conrad's brilliant courage and noble character, offered him the crown, and he was accordingly elected at Aix-la-Chapelle, March 7, 1138. He was immediately involved in a quarrel with Henry the Proud, Duke of Bavaria and Saxony, and this was the origin of the conflict that raged for centuries between the Welfs or Guelphs, the partisans of Duke Henry, and the Waiblingers or Ghibellines, the supporters of the Franconian house. (See GUELPHS AND Ghibellines.) In 1147 Saint Bernard of Clairvaux commenced to preach a new crusade, and Conrad set out for Palestine at the head of a large army (see CRUSADES), in company with his old enemy, Welf of Bavaria. He died February 15, 1152. Consult: Bernharti, *Jahrbücher des deutschen Reiches unter Konrad III.* (Leipzig, 1883); Jaffé, *Geschichte des deutschen Reiches unter Konrad III.* (Hanover, 1845).

CONRAD IV. (1228-54). King of the Germans from 1250 to 1254. He was the son of Frederick II., and was born at Andria, in Apulia, April 25, 1228. He was elected King of the Romans in 1237, but was never crowned. Frederick II. died in 1250, and Conrad and William of Holland contended for the imperial throne. Unable to make head against the increasing anarchy in Germany, Conrad retired to Italy in 1251, and succeeded in reëstablishing the power of the Hohenstaufen in Naples in the face of the hostility of the Papacy. He died of fever, May 20, 1254. Consult: Schirrmacher, *Die letzten Hohenstaufen* (Göttingen, 1871).

CONRAD, kōn'rāt, JOHANNES (1839—). A German political economist. He was born in West Prussia, and was educated at Berlin and Jena. He became successively professor of political economy at Jena and Halle, and took a

prominent part in the proceedings of the second commission appointed to revise the civil code of Germany. In 1878 he became editor of the *Jahrbücher für Nationalökonomie und Statistik*, and associate editor of the *Handwörterbuch der Staatswissenschaften* (1889-95; 2d ed. 1898 et seq.). His works include: *Das Universitätsstudium in Deutschland während der letzten fünfzig Jahre* (1884); *Grundriss zum Studium der politischen Oekonomie*, which work, originally published in 1896, within five years had appeared in a third edition.

CONRAD, JOSEPH. An English novelist, the son of a Polish revolutionist. He passed his youth in Poland. On the death of his father, Conrad, then only thirteen years old, wandered to Marseilles, where he became a merchant seaman and afterwards captain in the merchant service. He has embodied his experiences in the Malay Archipelago in novels, fresh in subject and in style. They comprise: *Almayer's Folly* (1895); *An Outcast of the Islands* (1896); *The Nigger of the Narcissus*, published in the United States as *The Children of the Sea* (1897); *Tales of Unrest* (1898); *Lord Jim* (1900); *The Inheritors*, with F. M. Hueffer (1901); *Typhoon* (1902), and others.

CONRAD, ROBERT TAYLOR (1810-58). An American judge and dramatist, born in Philadelphia, Pa. While a student he wrote *Conrad of Naples*, a tragedy successfully represented in many cities. He wrote also for the press, and in 1832 began the *Daily Intelligencer*, which was soon merged in the *Philadelphia Gazette*. Failing health compelled his retirement from editorial work, and he became judge of the Court of Criminal Sessions, continuing until its dissolution, when he resumed his literary work and became editor of *Graham's Magazine* and associate editor of the *Philadelphia North American*. From this work he was called to be mayor of his city, and from 1856-57 was judge of the Court of Quarter Sessions. Judge Conrad, although an able lawyer and a brilliant orator, will be best remembered by his literary productions, notably his *Aylmere, or the Bondman of Kent*, a drama which Edwin Forrest purchased and played. In 1852 this was published with other poems.

CONRAD, TIMOTHY ABBOTT (1803-77). An American paleontologist, born in New Jersey. He was geologist in 1837 and paleontologist from 1838 to 1841, to the State of New York, and published a number of works whose high scientific value was recognized in Europe as well as in the United States. His paleontological writings include: *American Marine Conchology* (1831); *Fossil Shells of the Tertiary Formations of the United States* (1832); *A Monography of the Family Unionida of the United States* (12 parts, 1835-59). He was also the author of numerous original papers, a list of which may be found in the catalogue of the Royal Society of England.

CONRADE. (1) In Shakespeare's *Much Ado About Nothing*, a follower of Don Juan, taken in custody by Dogberry and Verges. He is the bastard brother of Don Pedro. (2) In Scott's *Talisman*, the Marquis of Montserrat, a conspirator against Richard Cœur de Lion.

CONRÄDER, kôn'râ-dêr, GEORG (1838—). A German painter. He was born at Munich,

studied under Piloty at the academy there, and first attracted attention by his "Billy in the Grave-Digger's Dwelling at Leipzig." Other works of his are: "The Destruction of Carthage" (Maximilianum, Munich), and "The Death of the Emperor Joseph II." He was appointed to a professorship in the Munich Academy.

CONRADIN (kôn'râ-dên) **OF SWABIA** (1252-68). The son of Conrad IV., and the last descendant of the imperial house of Hohenstaufen (q.v.). At his father's death he was only two years old. Innocent IV. immediately seized upon the young prince's Italian possessions, on the plea that the son of a prince who died excommunicated had no hereditary rights; and other enemies of the House of Hohenstaufen were only too glad to follow the Pope's example. Conradin was not left, however, totally friendless. His uncle Manfred took up arms in his behalf, drove the Papal forces from Naples and Sicily, and, in order to consolidate his nephew's authority, declared himself King till the young prince came of age. This antagonism between the Papacy and the Hohenstaufen induced Clement IV. to offer the crown of the Two Sicilies to Charles of Anjou (q.v.), an able warrior and politician. Charles immediately invaded Italy, and met his antagonists in the plain of Grandella, where the defeat and death of Manfred, in 1266, gave him undisturbed possession of the kingdom. The Neapolitans, however, detested their new master, and sent deputies to Bavaria to invite Conradin, then in his fifteenth year, to come and assert his hereditary rights. Conradin accordingly made his appearance in Italy, and, being joined by the Neapolitans in large numbers, gained several victories over the French, but was finally defeated, and, together with his relative, Frederick of Baden, taken prisoner near Tagliacozzo, August 23, 1268. The two unfortunate princes were executed in the market-place of Naples, on October 29. Consult Schirmacher, *Die letzten Hohenstaufen* (Göttingen, 1871).

CONRART, kôn'râr', VALENTIN (1603-75). A French writer, born in Paris. A careful student of modern languages, he became an authority on matters of style. He gathered about him a weekly circle of littérateurs, who read and discussed original works. In 1634, under the auspices of Richelieu, this company was organized by royal letters patent as the French Academy, of which Conrart became perpetual secretary. He wrote little—a few poems, letters, and brief *Mémoires*, besides compiling copious extracts from contemporary writers. Hence the well-known verse from the *First Epistle* of Boileau: "J'imite de Conrart le silence prudent." Consult Kerviler and Barthélemy, *Conrart, sa vie et sa correspondance* (Paris, 1881).

CONRING, HERMANN (1606-81). A German physician, jurist, and miscellaneous writer, born at Norden, East Friesland. He studied at Helmstedt and Leyden, in 1632 was appointed professor of natural philosophy at Helmstedt, and in 1636 professor of medicine. He subsequently was transferred to the chair of politics. In 1664 he was granted a pension by Louis XIV. of France, and in 1669 was appointed by the King of Denmark a Councilor of State. He was a determined opponent of alchemy, and contended for the pharmaceutical value of chemistry and for Harvey's theory of

the circulation of the blood. His *De Origine Juris Germanici* (1643) was the pioneer work on the history of German law; and his *Exercitationes de Republica Imperii Germanici* (1674) was an important contribution to the literature of the civil law. A six-volume edition of his works was prepared by Göbel, with a biography (Brunswick, 1730). Consult Stobbe, *Hermann Conring, der Begründer der deutschen Rechtsgeschichte* (Berlin, 1870).

CONSALVI, kôn-säl'vê, ERCOLE, Marchese (1757-1824). A Papal diplomatist and reformer of abuses in the Papal States. He became chamberlain to Pope Pius VI. in 1783, and auditor of the Rota Romana in 1792, in which office he displayed great administrative ability. As secretary of the conclave at Venice, in 1799, he contributed mainly to the election of Pius VII., who in 1800 made him a cardinal and Secretary of State. In this capacity he concluded with great diplomatic skill the concordat with Napoleon in 1801; but having afterwards incurred the displeasure of the Emperor by his stout resistance to the encroachments of France on the rights of his sovereign, Napoleon demanded his removal from office in 1806. After the Emperor's downfall, the Pope sent him as his representative first to London, to meet the allied princes assembled there; then to the Congress at Vienna, where, by his tact and moderation, he succeeded in securing the restoration of the Papal States, the government of which he assumed as Secretary of State, continuing in office until 1823. His clever management of the relations to the European Powers resulted in the conclusion of concordats with most of them under conditions most favorable to the Papal authority, and he made his domestic policy memorable by beneficial reforms and the suppression of abuses in various branches of administration. The sciences, literature, and especially the fine arts, are much indebted to his liberal patronage.

CONSANGUINITY (Lat. *consanguinitas*, from *consanguineus*, having the same blood, from *com-*, together + *sanguis*, blood). The relationship which subsists between persons who are of the same blood; that is, who are descended from a common ancestor. It is either direct, which is the relationship between ascendants and descendants; or collateral, between persons who have a common ancestor but are in a different line of descent; as cousins, who have the same grandparents on either their fathers' or mothers' sides, but who are the issue of different children of those grandparents.

DEGREES OF CONSANGUINITY. For legal purposes different degrees of consanguinity are established. Thus, in the direct line, a child is in the first degree from its parents, a grandchild in the second degree, and so on. In the collateral line degrees are established beginning with brothers and sisters and extending to the most distant collateral relatives.

The method of computing degrees varies in different jurisdictions according as they follow the civil or canon law in this particular. By the civil law the degrees are separately numbered downward to each party, the common ancestor not being counted. Thus, by this rule brothers would be in the second degree, uncle and nephew in the third, and so on.

By the canon law, where the parties are equally removed from the common ancestor, consanguinity is computed by the number of degrees between them and the common ancestor, and by this rule brothers would be in the first degree and others correspondingly one degree less than under the civil law.

The question of consanguinity is important, and sometimes controlling in determining a person's legal rights, qualifications, or disabilities, especially as to entering into certain relations with another, or acting in certain capacities. Thus the law prohibits marriage between certain relations; judges and jurors and other officers are sometimes disqualified from serving in their particular capacities because of relationship with persons who may come before, or deal with, them in public matters; and consanguinity within the prohibited degree is the gravamen of the crime of incest. It is the controlling factor in the laws of inheritance and descent, which, although they vary somewhat in different jurisdictions, are always based on relationship; and blood relatives always take in preference to collaterals. See AFFINITY; COLLATERAL; MARRIAGE; SUCCESSION; HEIR.

CONSCIENCE (Lat. *conscientia*, from *conscire*, to be conscious, from *com-*, together + *scire*, to know). A term that has been used with various shades of meaning. Perhaps the definition that agrees best with general usage, and with the requirements of the scientific treatment of ethics, is that conscience is the process of consciousness which surveys one's own past, present, or contemplated action, and judges that it comes up to or falls short of a moral standard—a process which is pleasant or unpleasant according as the judgment approves or condemns the act. See ETHICS.

CONSCIENCE, COURTS OF. English courts for the recovery of small debts, constituted by special local acts of Parliament in London, Westminster, and other trading districts. These courts were also called *courts of requests*. The first of these, the Court of Conscience for London, was created in the ninth year of Henry VIII., but others were subsequently established and their jurisdiction and procedure minutely regulated by Parliament. They were freely resorted to for the small cases within their jurisdiction, which was originally limited to 40s., but afterwards extended to £5. With the reorganization of the county courts in 1888 (the County Courts Act, 51 and 52 Viet. c. 43) the courts of conscience lost their importance, and were, with a few exceptions, abolished. See COURT.

CONSCIENCE, kôn'syân's, HENDRIK (1812-83). A Belgian novelist, distinguished for his pictures of Flemish village life. He was born in Antwerp, December 3, 1812, and was largely self-educated. He entered the army in 1830, left it in 1836, and in 1837 published his first novel in Flemish, *In the Wonderful Year 1566*, which won him great success, but left him in debt to his printer. Patronage secured him a post in a Government office. He wrote *Phantasy* (1837), a collection of fantastic tales, and *The Lion of Flanders* (1838). Finding office work irksome, he abandoned it for gardening, which in turn he gave up for a sinecure at the Royal Academy of Painting. In 1845 he was appointed associate professor in the University of Ghent and in-

structor in Flemish to the royal children. In 1868 he was made custodian of the Wiertz Museum. These posts and others were rewards for unlagging efforts to revive and stimulate a literary interest in Flemish. He died in Brussels, September 10, 1883. Among other well-known works of Conscience, most of which are translated into French and German and a few into English, are: *How One Becomes a Painter* (1843); *The Poor Nobleman* (1851); *The Good Luck to be Rich* (1855); *Duke Karl's Justice* (1876); *Benjamin of Flanders* (1880). He has probably contributed more than any other individual to the revival of Flemish literature. For his biography, consult Eckhoud (Brussels, 1881), and Pol de Mont (Haarlem, 1883).

CONSCIENCE WHIGS. A name applied to those members of the Whig Party in Massachusetts who in 1850 and thereafter refused to cooperate with those of their old associates—the so-called 'Cotton Whigs'—who declared that the slavery question had been permanently settled by the Compromise of 1850. In New York the two factions were known respectively as the 'Woolly Heads,' or 'Seward Whigs,' and the 'Silver Grays,' or 'Snuff-Takers.'

CONSCIOUS LOVERS, THE. A comedy by Sir Richard Steele (1722), modeled upon Terence's *Andria*. This play was an attempt by Steele to purify the stage, and is referred to in Fielding's *Joseph Andrews* as the only fit play for a Christian to see.

CONSCIOUSNESS. A term employed by psychology in two principal meanings. (1) In the first meaning, it is the equivalent of 'mental endowment' or 'the possession of mind.' I am conscious of the objects and persons about me, of my own successes or shortcomings, of the validity of an argument or the beauty of a work of art, in the sense that I am mentally alive to these things, am capable of a mental reaction upon them, whether by way of mere perception or by way of critical estimate and appreciation. So if I am sound asleep, or in stupor from a blow on the head or from the action of some drug, I am said to be 'unconscious'; my mental life and reactions are in abeyance. This meaning, which would perhaps have lapsed from psychological usage were it not deeply rooted in the phraseology of philosophy and in popular parlance, must be carefully distinguished from the second and more technical meaning, according to which (2) consciousness is simply 'present mind,' 'mind now,' the total mental experience given at a particular time. "Consciousness," says Wundt, "does not mean anything that exists apart from mental processes; nor does it refer merely to the sum of these processes, without reference to their mode of interrelation. It expresses the general synthesis of mental processes, within which the single complexes are marked off as more intimate connections." It is "a comprehensive interconnection of simultaneous and successive mental processes." We may therefore define it as a cross-section or temporal division of mind (q.v.); mind consists of a series of consciousnesses, more or less sharply differentiated. As we begin the day we have the waking consciousness, followed by the getting-up consciousness, the breakfast consciousness, the work consciousness, etc., etc.

The separate complexes which enter into and compose a consciousness are termed the 'contents of consciousness.' Thus, the consciousness of a writer, at his desk, contains various psychological ideas, mostly in verbal form; the perceptions of sight and touch that are aroused by the act of writing; a general feeling of effort, etc. The question of the 'range of consciousness,' i.e. of the number of mental processes that a single consciousness can contain, has been approached experimentally, and partly answered. It is found, e.g. that if an auditory consciousness be set up, by subjecting an observer (whose mind is otherwise unoccupied) to a continued series of metronome strokes, its range lies between the limits of 8 double impressions (16 strokes, rhythmically grouped in twos) and 5 eightfold impressions (40 strokes, rhythmically grouped in eights). In other words, a practiced observer can distinguish, without counting, between two successive series of 40 and of 39 strokes, if he be allowed to group by eights; whereas he cannot, however he may group them, distinguish between series of 41 and 42 strokes; these numbers exceed the maximal range of consciousness. The phrase 'state of consciousness,' formerly applied to mental processes like ideas, emotions, etc., now designates the mode of existence (clearness, prominence, obscurity, inhibition) of the contents of a particular consciousness; it is fully explained under ATTENTION (q.v.). Other phrases in general use are 'field of consciousness' and 'stream of consciousness,' the one formed after the analogy of the phrase 'field of vision,' the other emphasizing the essentially transient nature of conscious contents. Consult: Wundt, *Human and Animal Psychology* (London, 1896); id., *Outlines of Psychology*, trans. by Judd (London, 1898); Titchener, *Outline of Psychology* (New York, 1899); James, *Principles of Psychology* (New York, 1890). See SELF-CONSCIOUSNESS; UNITY OF CONSCIOUSNESS.

CONSCIOUSNESS, UNITY OF. See UNITY OF CONSCIOUSNESS.

CON'SCRIPT FATHERS. A name given to the Roman senators after the expulsion of the Tarquins, when Brutus added 100 to the number of senators, the names of the newcomers being 'written together' (*conscripta*) on the rolls with those of the original councilors. The proper designation was then *Patres et Conscripti*, afterwards abridged to *Patres Conscripti*.

CONSCRIPTION (Lat. *conscriptio*, from *conscribere*, to enroll, from *com-*, together + *scribere*, to write). The enlisting of men for military service by a compulsory levy. Conscription, in its modern sense, is built on the military constitution of ancient Rome. Four legions of infantry, two for each consul, and each legion containing 6666 men, were annually levied. The consuls, who in the time of the Republic were always commanders of the army, would announce by herald or written proclamation that a levy was to be made. The proper conscription was as follows: *Milites cogere, colligere, scribere, conscribere*. From 1798 conscription by compulsory levies, and individual selection determined by the drawing of lots, prevailed in France; but in 1872 substitution was abolished and personal service made obligatory on every man not physically unfit. Prussia followed France with a conscription system in

1813, which in a more exacting form was made universal throughout the German Empire in 1887. Continental European nations generally have now adopted it in one form or another. In England, the Ballot Act of 1860 provides that all males over 5 feet 2 inches in height, and between the ages of eighteen and thirty, be called upon to serve in the militia; but it is kept from enforcement by an annual army act passed for that purpose. During the Civil War President Lincoln several times recruited the armies of the North by levying drafts of men.

CONSCRIT DE 1813, kōx'skré' de mé lwē sän tráz, LE. An historical novel by Erckmann-Chatrian (1864). The hero, Joseph Bertha, is a poor young man who relies on his physical disabilities to save him from military service, but who is forced to join the ranks. His story sets forth the author's solution of the problem of harmonizing patriotism with the hatred of war.

CONSECRATION (Lat. *consecratio*, from *consecrare*, to hallow, from *com-*, together + *sacrare*, to consecrate, from *sacer*, holy). The act of solemnly dedicating a person or thing to the service of God. It is one of the most widely spread of all religious ceremonies of the ancient world, having been practiced in Chaldea, Egypt, India, Judea, Greece, Rome, Britain, and other countries. In the Old Testament we read of the consecration or dedication of the first-born, both man and beast, to the Lord, also the dedication of the Levites, of the tabernacle and altar, of fields, houses, walls, etc. The custom of consecrating the places of public worship developed in the Christian Church as soon as persecution ceased, when, according to Eusebius, "the sight was afforded so eagerly desired and prayed for by all—the festivals of dedications and consecrations of the newly erected houses of prayer throughout the cities." Eusebius also describes the consecration of the church built at Jerusalem by Constantine in A.D. 335. The practice of consecrating religious edifices has continued in the Oriental, Roman, and Anglican churches. The forms, as found in the sacramentaries of Gelasius and Saint Gregory, were at the first very simple, but they were gradually developed until, in the Roman Catholic Church, the office of consecration became a long and impressive ceremony. It includes the placing in the altars of relics of the saints, the purification of the place with specially prepared holy water (called Gregorian Water because the formula for its benediction is first found in the sacramentary of Saint Gregory), and the anointing of the church in twelve specified places with holy oil. The anniversary of this ceremony is kept as a festival of the first class. A church may not be consecrated until it is entirely free from debt; when the consecration is delayed, it is opened with a simple form of benediction. The ceremonies in the Eastern churches are as elaborate and not dissimilar. In the Church of England each bishop is left to his own discretion as to the form to be adopted, but that most generally used is the form sent down by the bishops to the Lower House of Convocation in 1712. The American prayer-book provides a simple form of prayer, which retains the old ceremony of the bishop knocking for entrance at the door of the church. For the consecration of bishops, see BISHOP; ORDERS.

HOLY; for that of the eucharistic elements, see MASS; LORD'S SUPPER.

CONSECUTIVES (Fr. *consécutive*, Sp., Port., It. *consecutivo*, from Lat. *consequi*, to follow, from *com-*, together + *sequi*, Gk. *ἐπείθεαι*, *hepēsthai*, Lith. *skėti*, Skt. *sac*, to follow, Goth. *saihwān*, Icel. *sjá*, AS. *sēon*, OHG. *schan*, Ger. *schen*, Engl. *see*). In music, the progressions of parallel fifths or octaves, which, according to the strict rules of harmony, are forbidden.

CONSENT (OF. *consente*, from *consenter*, to consent, from Lat. *consentire*, to agree, from *com-*, together + *sentire*, to think). In law, the free will and assent of the mind of a competent person to some act or obligation affecting his legal rights or relations. The law prescribes under what conditions it is binding, and when it is void or voidable. Thus, apparent consent obtained by fraud or coercion, or from an infant, or from an insane, intoxicated, or otherwise legally incompetent person, is deprived of all legal effect if such person chooses to avoid it. It is an essential element of contract, and is of the greatest importance in certain cases in the law of crimes and torts, where the essence of the crime or wrong is that it was against the will of the person injured. One may legally consent to the infliction of a limited amount of bodily harm if there is no malice involved, as in friendly boxing or in football; but one cannot consent to the infliction of death or anything which will amount to a breach of the peace. See AGE; CONTRACT; CRIME; TORT.

CONSENTES DI'I (Lat. *consentes*, of uncertain etymology and meaning, probably from *com-*, together + *sens*, being, pres. p. of *esse*, to be, cf. Skt. *sant*, being, from *as*, to be; less probably for *conscutiens*, *consentire*, to agree). The twelve chief Roman deities: Jupiter, Apollo, Mars, Neptune, Mercury, Vulcan, Juno, Vesta, Minerva, Ceres, Diana, and Venus.

CONSERVATION OF ENERGY, PRINCIPLE OF. See MECHANICS; ENERGETICS.

CONSERVATION OF MATTER. See MATTER, section *Properties of Matter*.

CONSERVATIVE. See WHIG; TORY; and POLITICAL PARTIES, GREAT BRITAIN.

CONSERVATIVE CLUB, THE. A Tory club founded in London in 1840. Its club-house is in Saint James Street.

CONSERVATOR OF THE PEACE. In the law of England, an ancient office of great dignity and authority. It existed at common law as an incident of certain tenures of lands held immediately of the King; or the King might appoint one to be his warden or the conservator of his peace; and before the institution of justices of the peace certain officers were so appointed. Now the only official conservators of the peace are certain officers who hold this power annexed to the offices which they hold. The sovereign, by virtue of his office, is the principal conservator of the peace in British realms. Several high officers of the Crown, the Chancellor or Lord Keeper, the Lord High Steward, the Lord Marshal, and the Lord High Constable, when there are such officers, all the justices of the Queen's Bench, the Master of the Rolls, are conservators of the peace throughout the whole kingdom, and may commit breakers of the peace or bind them in recognizances anywhere. Other

judges possess this power only within the limits of their own jurisdiction. The sheriff and coroner are conservators of the peace within their respective counties, and constables, tithing-men, etc., within their jurisdictions. The phrase is not in use in the United States. Consult Stephen, *Commentaries on the Laws of England* (13th ed., London, 1899).

CONSERVATORY (ML. *conservatorium*, place for preserving anything, from Lat. *conservare*, to preserve, from *com-*, together + *servare*, to keep, Ar. *har*, to preserve). A school for the cultivation of music in all its branches. Besides strictly musical subjects, stage department and the modern languages used in singing (German, French, Italian) are usually included in the curriculum. Originally, however, a conservatory was not a school of music, but an orphan asylum or institution of a benevolent character for the care of children of the poor. Such children as showed a talent for music were educated in the art. At first this instruction was given to the inmates only, but subsequently day-scholars also were admitted upon payment of a moderate fee. The oldest conservatory is the Conservatorio Santa Maria di Loreto in Naples, founded in 1537. Within the same century three more conservatories were established in the same city. By order of King Murat these were consolidated, in 1808, under the name Collegio Reale di Musica. Venice had four such institutions which ceased to exist with the downfall of the Venetian Republic. To-day the Conservatory of Venice is known as the Liceo Benedetto Marcello. The success of these schools was so pronounced that soon conservatories were founded all over Italy. Among the best known are (1) the Regio Conservatorio di Musica, in Palermo, founded 1615; (2) the Liceo Musicale, in Bologna, founded 1861, noted for its magnificent library, the greater part of which was bequeathed to it by Padre Martini and Gaetano Gaspari; (3) the Regio Conservatorio di Musica, in Milan, founded 1807; (4) the Civico Istituto di Musica, in Genoa, founded 1829; (5) the Liceo Musicale, in Turin, founded 1865; (6) the Liceo Musicale Rossini, in Pesaro, established in 1882 by a gift of 2,300,000 lire from Rossini. In France the necessity of a school for the education of singers led to the establishment, in 1784, of the Ecole Royale de Chant et de Déclamation. During the French Revolution, in 1793, owing to the scarcity of instrumental performers for the army, the course was extended, and the name was then changed to Institut National de Musique. In 1795 it was reorganized and has since been known as the Conservatoire de Musique. To-day it is beyond all question the most famous music-school in the world. Prizes are awarded in all the classes. The highest honor conferred is the Grand Prix de Rome, which entitles the winner to a three years' stay in Italy with a single condition: that the holder send from time to time original compositions as evidence of his progress. Nearly all the famous French composers of the last century have been winners of this prize. (See **PRIX DE ROME**.) There is scarcely a musician of note in France who has not been at some time a professor in the Conservatory. The directors since its foundation have been Sarette (the founder, 1784-1814); Perne (1814-22); Cherubini (1822-42); Auber (1842-71); A. Thomas

(1871-96); Dubois (1896—). The oldest among the German conservatories is that of Prague, founded 1811, which, in addition to the usual musical courses, offers also a liberal-culture course. The Vienna Conservatory was opened in 1817 by Salieri as a school for singing. It became a true conservatory in 1821. The most famous conservatory in Germany is that in Leipzig, founded by Mendelssohn and Schumann in 1843. Among its professors have been M. Hauptmann, L. Plaidy, E. F. Richter, Hiller, Gade, Moscheles, Reinecke, and Brendel. Among its pupils were Grieg, Sir A. Sullivan, Svendsen, Wilhelmj, Kirchner, Jadassohn. The oldest Berlin conservatory was founded in 1850 by Kullak, Marx, and Stern. Among its professors were Bülow, Kiel, de Ahna, B. Scholz. The Neue Akademie der Tonkunst (chiefly for piano) was opened in 1855 by Kullak. The most important of the Berlin conservatories is the Königliche Hochschule für Musik, a branch of the Royal Academy of Arts. It is divided into three parts: (1) Königliches Institut für Kirchenmusik; (2) Abteilung für musikalische Komposition; (3) Abteilung für ausübende Tonkunst. Among the professors have been Joachim, Ph. Spitta, Bargiel, Herzogenberg. The conservatory of Cologne was founded in 1850 by Hiller. The Dresden Conservatory was founded 1856, and that of Stuttgart in the same year. The famous Königliche Musikschule in Munich, founded 1867, offers, besides the musical, liberal-culture courses. Among the other famous German conservatories of to-day are those in Würzburg, Frankfurt, Hamburg, Breslau, Strassburg, Karlsruhe, Regensburg (church-music). Besides these public or State conservatories there are also a number of not less famous private conservatories, such as those of Sehawenka, Schwanzler, Klindworth, Freudenberg. Switzerland also boasts some efficient conservatories in Geneva, Zurich, Basel, Bern. One of the greatest and best-known conservatories is that in Brussels, founded 1813, among the directors of which were Fétis and Gevaert. The conservatories in Liège and Ghent are also famous. In Antwerp Peter Benoit founded, in 1867, entirely after German models, the well-known Vlaamsche Muziekschool. Nor is Holland behind in the efficiency of her conservatories. The Maatschappij tot bevordering van tonkunst was opened in 1862 at Amsterdam. Also the conservatories in Rotterdam and The Hague have risen to importance. The oldest conservatory in Russia is that of Warsaw, founded 1821; the most famous, that in Saint Petersburg, established 1862. Among its professors were Zarembo, Anton Rubinstein, Leschetitzky, Wieniawski, Davidoff, and Tschaikowski. A conservatory was also founded in Moscow in 1864 by Nicholas Rubinstein. In England we find five conservatories in London—the Royal Academy of Music (1822); the London Academy of Music (1861); the Trinity College Conservatory (1872); the Guildhall School of Music (1880). The best of all is the Royal College of Music, established originally by Sir Arthur Sullivan as the National Training School of Music (1876). Sir George Grove was the first director under the reorganized administration (1883-94). He was succeeded (1894) by C. H. Passy. All other European countries have now conservatories of more or less importance. In the United States

music has made enormous strides within the last quarter of a century, and conservatories have been founded in nearly all the larger cities. The best-known is the National Conservatory of Music of America, founded in New York, 1885. For a time A. Dvořák was the director. He was succeeded by Emil Paur. Among its professors have been Anton Seidl, R. Joseffy, B. O. Klein, D. Buck. Other well-known conservatories are the Peabody Institute in Baltimore (1871), the Cincinnati College of Music (1878), the New England Conservatory of Music in Boston (1882). Besides, some of the great American universities have added a complete course of music to their regular curriculum, as Harvard (John K. Paine), Yale (Horatio W. Parker), Columbia (E. A. MacDowell).

CONSERVATORY. In horticulture, a glass house used for the preservation of tender exotics and the display, rather than the propagation or growing, of plants which have been brought to their ornamental perfection in a greenhouse. The term is often applied loosely to any ornamental greenhouse. See GREENHOUSE.

CON'SHOHOCK'EN. A borough in Montgomery County, Pa., 13 miles northwest of Philadelphia; on the Schuylkill River, and on the Pennsylvania and the Philadelphia and Reading railroads (Map: Pennsylvania, F 3). The more important industrial establishments include rolling-mills, steel-mills, foundries, furnaces, surgical-implement works, and cotton and woolen mills, the principal products of which form the basis of an extensive trade. Conshohocken was founded in 1830, and was incorporated as a borough in 1852. Population, in 1890, 5470; in 1900, 5762.

CONSIDÉRANT, kôn'sé'dá'rán', VICTOR PROSPER (1808-93). A French socialist, born at Salins, in the Department of Jura. After being educated at the Ecole Polytechnique in Paris, he entered the army, which, however, he soon left to promulgate the doctrines of Fourier (q.v.). After the death of his master, Considérant became the head of the Societarians (q.v.), and undertook the management of the *Phalange*, a review devoted to the propagation of their opinions. Having gained the financial support of a young Englishman, Mr. Young, he established (1832) on a large scale, in the Department of Eure-et-Loir, a Socialist colony or *phalanstère*; but the experiment failed, and with it the *Phalange* went out of existence. However, a new organ of coöperative doctrine, the *Démocratie pacifique*, was soon established, and was edited by Considérant with great zeal, perseverance, and ability. In 1848-49 he was a member of the Constituent Assembly, but was accused of high treason and compelled to flee to Belgium. Thence he emigrated to Texas, where he founded, near San Antonio, a Societarian community, La Réunion; this, however, proved a failure, and Considérant returned to France in 1869. The most important of his numerous writings is *Destinée sociale* (1834-45). See COMMUNISM.

CONSIDERATION (Lat. *consideratio*, from *considerare*, to observe, from *com-*, together + *sidus*, star). In the law of contracts, in the case of a simple contract, a detriment or the surrender of a right by one party in exchange for the promise of the other party. In case of a bilateral contract—i.e. one in which the promises

are mutual—each promise is a consideration for the other. A consideration is essential to a valid simple contract. A mere promise made without a consideration is called by lawyers a naked promise (*nudum pactum*), and on it suit will not lie. Such a promise, even though made in writing, is not a valid legal contract; but by the law of negotiable paper it is presumed to be given for valid consideration. This presumption may be rebutted as between maker and payee, but is conclusive in favor of *bona fide* holders for value, against whom want of consideration is never a defense by the maker of negotiable paper. The requirement of consideration as a necessary element in a simple contract is due to the historical development of the contract action of *assumpsit* (q.v.) as an action in tort. In that action the plaintiff was required to show that he had given up a right or suffered some detriment in reliance upon, or in exchange for, the defendant's promise, by reason of which he had been damaged. Thus a consideration need not be in the form of a direct benefit to the contracting party, but may be something involving loss or prejudice to the second party to the contract. A service rendered gratuitously is not a consideration which will support a promise to pay for the service made subsequently to the rendering of the service, because such service is not rendered in reliance upon, or in exchange for, the promise; thus, where one man voluntarily rescues another's property from loss, and the second party promises to pay therefor, that promise cannot be sued upon even though made in writing. So a promise to reward another for performing his legal duty cannot be sued upon, since the performance of a legal duty is not the surrender of a right or any detriment in a legal sense. Thus, if a taxpayer promises to pay a policeman for guarding his house, it is held that, since it is the policeman's duty to guard the public's property, there has been no real consideration and no legal contract, and the promise of a debtor to pay his debt is not a consideration for a contract, as the promisor is already under a legal obligation to pay his debt. If, however, the promise is made after the debt is barred by the statute of limitations, the promise has the effect of reviving the obligation, and may be sued upon although no consideration is given for it. This is anomalous. The law takes no account of the adequacy of consideration if the contract is made in good faith; but if inadequacy results from fraud or mistake, the contract may be rendered void or voidable according to the circumstances of the case. If the consideration given is contrary to public policy, or is a promise to do an illegal act, the contract based therein is illegal and void. If the consideration be illegal only in part, still the contract is void unless it is possible to separate the illegal and the legal so that the one may be thrown out as void and the other enforced. Failure by one party to a contract to perform his contract is commonly, though erroneously, stated to be failure of consideration. The effect of a true failure of consideration is to prevent the formation of a contract. See CONTRACT; MISTAKE; FRAUD.

CONSIGNMENT (from Fr. *consigner*, to consign, from Lat. *consignare*, to seal, from *com-*, together + *signare*, to sign, from *signum*, sign). In mercantile law: (1) A quantity of goods de-

livered by one party, called the consignor, to another, called the consignee, for custody, for transportation, for sale, or pursuant to a contract for their sale. When they are delivered to a common carrier for transportation, the consignment is generally evidenced by a *bill of lading* (q.v.). (2) The act of consigning goods. See BAILMENT; CARRIER, COMMON; FACTOR.

CONSISTORY (Lat. *consistorium*, from *consistere*, to stand together, from *com-*, together + *sistere*, to station, from *stare*, to stand). Properly a place of assembly, but in later Latin the word came to mean a particular place where the Council of the Roman Emperor met, and, after the time of Diocletian and Constantine, the Council itself, which became the supreme judicial tribunal of the later Roman Empire. Up to the time of Marcus Aurelius, the Roman Emperor frequently exercised in person the supreme judicial authority, which covered matters brought directly before him for decision, as well as appeals from the judgments of the provincial praetors in all parts of the Empire. In the troublous times which succeeded, this function was devolved upon a council, made up largely of jurists, which acted in his name, and whose judgments were of equal authority with statutes immediately promulgated by him. These judgments of the consistory were known as decrees (*decreta*) and formed an important part of the imperial legislation (*constitutiones*) of the later Empire. In the membership of this Council were the imperial officials, and its function was to deliberate on the important affairs of legislation, administration, and justice. The form of the imperial consistory passed over into the early Christian Church. The bishops established their consistories, and the name was applied to the assemblies of the Roman clergy and the bishops of the suburban sees, out of which the College of Cardinals has developed. Public consistories are now held in the Vatican for formal functions, such as the giving of the hat to a cardinal, the final decision on the question of canonization, or the reception of an ambassador. Private consistories, to which none but cardinals have access, discuss a variety of administrative matters, such as the erection of new sees and the nomination of cardinals and bishops. The detailed work, however, is done in the committees, which are known as consistorial congregations. (See CONGREGATION.) In the Greek Church each bishop has his own consistory of three to seven members nominated by him and confirmed by the Holy Governing Synod. An appeal lies from the consistory to the bishop, and from the bishop to the synod.

In English ecclesiastical law, the consistory or consistorial court is the tribunal in which the bishop exercises his ordinary legal jurisdiction. This jurisdiction was formerly very extensive, including the trial for common-law offenses of clerks, or persons entitled to claim exemption from the process of the secular tribunals (see BENEFIT OF CLERGY), and to a very recent date the cognizance of all matrimonial causes, the probate of wills, the administration of decedents' estates, etc. The reform of the judicial procedure in England in 1857 transferred the latter classes of cases to the jurisdiction of the ordinary tribunals, leaving to the consistorial courts only their more strictly ecclesiastical jurisdiction. This is very consider-

able, however, and includes the trial of a clergyman for offenses against morality as well as upon questions of doctrine or ritual. In general, an appeal lies from the judgment of the consistory court to that of the archbishop—the Court of Arches (of Canterbury)—or the Chancery Court of York. The presiding officer of the consistory is the chancellor of the diocese, his judicial title being variously the ordinary, the official-principal, and vicar-general. See those titles; also ECCLESIASTICAL COURTS; ECCLESIASTICAL LAW; and consult Phillimore, *Ecclesiastical Law of the Church of England* (2d ed., London, 1895).

In the Lutheran State churches the consistory is a board of clerical officers either national or provincial, usually appointed by the sovereign and charged with various matters of ecclesiastical administration. These bodies exercise a supervision and discipline over the religion and education of the people, as well as over the clergy and the schoolmasters, and examine the candidates for the ministry for license and ordination. They have also the regulation of public worship and the administration of church property. In the Protestant churches of France the consistory exercises a more restricted jurisdiction than in Germany. In the Reformed (Dutch) Church the consistory is the lowest ecclesiastical court, having charge of the government of the local church and corresponding to the session of a Presbyterian church.

CONSOLACIÓN DEL SUR, kōn'sō-lā'thé-ōn' dēl sōor (Sp., Consolation of the South). A town in the Province of Pinar del Rio, Cuba, about 15 miles northeast of Pinar del Rio. It is noted for the excellent tobacco produced in its vicinity. Population, in 1899, 3062.

CONSOLATO DEL MARE (Sp., Consulate of the Sea). A celebrated code of maritime law, compiled, it is believed, at Barcelona in the fourteenth century, and made up of the settled usages, in respect to trade and navigation, of the maritime communities of the Mediterranean. The earliest copy known was published at Barcelona, in 1494, in the Catalan language. It contains (1) a code of procedure issued by the kings of Aragon for the guidance of the courts of the consuls of the sea; (2) a collection of ancient customs of the sea; and (3) a body of ordinances for the government of cruisers of war. It enjoyed considerable authority, and has passed, by legislation and by judicial adoption, into the maritime law of Europe and America. Its provisions were largely embodied in the French Maritime Code of 1681 (*Ordonnance sur la marine*). The code was translated into Italian and printed in Venice in 1549, and French, Dutch, German, and English translations have also been made. The most valuable portion, the customs of the sea, will be found printed in English in the appendix to the *Black Book of the Admiralty* (London, 1874). Consult: Robinson, *Collectanea Maritima* (London, 1801); Pardessus, *Collection des lois maritimes antérieures au 18ème siècle* (Paris, 1828-45); Reddie, *Researches, Historical and Critical, in Maritime International Law* (Edinburgh, 1844-45); Wheaton, *History of the Law of Nations in Europe and America* (New York, 1845); Schaubé, *Das Konsulat des Meeres in Pisa* (Leipzig, 1888); Valroger, *Etude sur l'institution des consuls de la mer au moyen-âge* (Paris, 1891).

CONSOLE, *kōn'sōl* (Fr., probably ultimately from Lat. *consolidare*, to strengthen, from *com-*, together + *solidus*, firm). In architecture, a projection resembling a bracket or corbel, frequently in the form of a letter S or of a single or double scroll, used to support cornices, or sometimes busts, vases, figures, etc. Consoles are often richly ornamented, and are, in fact, almost purely decorative features, differing in this from brackets (q.v.) and corbels (q.v.), which have a structural function.

CONSOLIDATION (Lat. *consolidatio*, from *consolidare*, to strengthen) **ACTS**. Statutes which combine in a single act all previous statutes relating to, and coming under, the same general subject-matter. As a general rule, this cannot be done by a mere collocation, or gathering together under one head, of acts of different dates in their original form; but they must be re-written, arranged in sections, all inconsistencies and surplusage be omitted, and uniformity of expression obtained, so that the whole may be a complete and logical act. Frequently, in order to do this, amendments to many of the measures which it is proposed to bring together are passed, and then they are re-enacted by the consolidation act. The meanings of various technical terms in the statutes are usually defined and explained in a sort of prefix, which is made a part of the whole, and is thus binding on the courts. The acts which are consolidated, and thereby superseded, are repealed by an express provision in the same measure. Consolidation measures have proved successful in England in rendering their statute law more simple and concise. Several of the United States have followed the idea, but generally have gone further, and enacted all the existing law on a given subject, whether contained in statutes or decisions, and the result is more in the nature of a codification act than a consolidation act as known in England. See **CODE**; **REVISED STATUTES**.

CONSOLS. A contraction of the words 'consolidated annuities.' In incurring the English debt, the Government borrowed money at different periods on special conditions, being generally the payment of an annuity of so much per cent. on the sum borrowed. Great confusion arose from the variety of stocks thus created, and it was thought expedient to strike an average of their value, and consolidate them into one fund, kept in one account at the Bank of England. The Consolidated Annuities Act was passed in 1757.

CONSONANCE (Lat. *consonantia*, from *consonare*, to sound together, from *com-*, together + *sonare*, to sound, from *sonus*, Skt. *svana*, sound, from *svan*, to resound), or **CONCORD**. In music, the simultaneous sounding of two or more tones belonging to the same major or minor triad. The effect upon the ear is entirely satisfying, so that further progression or resolution is not required, as it is in the case of dissonance (q.v.). This feeling of rest is attributed to the simple ratios existing between the number of vibrations of consonant intervals; whereas the ratios between dissonant intervals are complex. Consonant intervals are the unison, perfect fourth, fifth, and octave, as well as major and minor thirds and sixths. (See **INTERVAL**.) Chords formed by only consonant intervals are consonant chords. They are of two kinds, major and minor triads;

the major triad consisting of tonic, major third, and perfect fifth, the minor composed of tonic, minor third, and perfect fifth. See **ACOUSTICS**; **CHORD**; **HARMONY**; **TRIAD**.

CONSONANT. See **LETTERS**.

CONSORT (Lat. *consors*, partner, from *com-*, together + *sors*, lot; probably connected with Lat. *serere*, Gk. *εἶπερ*, *circin*, Skt. *si*, to join together). A term applied to the husband or wife of a reigning sovereign, viewed in a public capacity. Whatever political influence may attach to the position, the probability that the consort will attempt to secure some share in the royal prerogative is naturally greater where the consort is the husband; and as the royal spouse is most frequently a foreigner, national legislatures have always been careful to restrict his activity to the ornamental functions of royalty. In some cases, however, the husbands of ruling sovereigns have been granted a share in the government, a notable instance being that of Ferdinand of Aragon, who on his marriage to Isabella of Castile was declared joint ruler of that country.

CONSPIRACY (OF. *conspiracie*, *conspiratic*, from Lat. *conspirare*, to conspire, from *com-*, together + *spirare*, to breathe). As a criminal offense this has been judicially defined as "a combination by two or more persons, by some concerted action, to accomplish an unlawful purpose, or to accomplish a purpose not in itself unlawful, by unlawful means." It will be observed that the gist of this offense is in the agreement or confederation of the conspirators; an overt act pursuant to the agreement is not necessary to the completion of the crime, although, in most cases of conspiracy, such acts are performed. This doctrine of the common law has been changed by Federal legislation and by statutes in many of the United States. Under such legislation, the commission of an overt act to effect the object of the conspiracy is essential to consummate the crime; but as soon as that act is done the offense of conspiracy is complete, and is not in any way affected by the nature or results of the act, even though the act be such that it could not possibly accomplish the conspirator's intention.

When a conspiracy has been entered into, the conspirators become so related legally that the acts or statements of any of them in reference to the common purpose are admissible against all—each is the authorized agent of all. This rule often induces the public prosecutor to have persons indicted for a conspiracy, even when their confederation has resulted in the commission of other crimes, such as treason or murder.

Some of the more important common-law conspiracies were those to commit treason or sedition, to murder, to cheat and defraud, and to maliciously injure another. They were misdemeanors only. Statutory conspiracies, that is, acts declared by legislation to be punishable as conspiracies, have been raised to the rank of felonies, in some instances.

Whether conspiracy is a civil wrong of itself is a question upon which judges and writers differ. There is eminent authority for the view that it is a distinct tort—an actionable wrong, without respect to the consequences of the acts done pursuant to the confederation. The prevailing view at present, however, both in Eng-

land and in the United States, is that the gist of the civil cause of action is the actual damage done to the plaintiff, not the agreement or confederation against him.

Consult: Wright, *Law of Criminal Conspiracies* (London, 1873; Philadelphia, 1887); Bishop, *New Commentaries on the Criminal Law* (Boston, 1900); and *Commentaries on the Non-Contract Law* (Boston); also consult the *Encyclopædia of the Laws of England* (London, 1897).

CONSTABLE, kün'stä-b'l (OF. *conestable*, Fr. *conñtable*, from ML. *constabulus*, *comes stabulus*, *comistabuli*, constable, from Lat. *comes stabuli*, count of the stable). (1) An officer of great dignity and authority in the Eastern Roman Empire, whence the office passed, with varying functions but no loss of authority, to the western nations of Europe. The Constable of France, as commander-in-chief of the army and navy and chief arbitrator in chivalry, became the most powerful officer and dignitary in the State after the King, and, because of the danger to the Crown that lurked in its greatness, the office was abolished by Richelieu in 1627. The dignity was revived by Napoleon Bonaparte, but again abolished after the restoration of the monarchy. Across the Channel the office existed with similar functions, under the title of Lord High Constable of England, but it never attained to the authority which attended it in France, and it was suspended for reasons of economy by Henry VIII. It is now filled by temporary appointment on great occasions of state, as the coronation of the monarch, etc. Formerly the Lord High Constable, in conjunction with the Earl Marshal of England, held the courts of chivalry, or honor, and the courts martial of the kingdom. But the former jurisdiction has now completely lapsed, and courts martial are held by the ordinary military authorities. The court of the constable and marshal, therefore, while still nominally in existence, is practically obsolete. The office of constable still survives in Scotland, where it has become an hereditary dignity of the earls of Errol, but shorn of its former authority.

(2) The office of constable also existed in England with the signification of warden or keeper of certain royal castles and fortified towns. In a few cases it long survived as an hereditary office, and in some others it is filled by royal appointment. Of the latter class are the constables of the Tower of London and of Windsor and Dover castles.

(3) The peace officer whom we know as constable is the petty constable of English law, an officer of great antiquity—so called to distinguish him from the High Constables of Hundreds, created by the Statute of Winchester, 13 Edward I. (1285). The office has in recent years lost much of its importance in England, the institution of county and borough police having deprived it of most of its functions. In most of the United States, however, outside the cities, the constable continues to be the principal officer of the peace. As such he is invested with large powers of arresting, imprisoning, breaking open houses, executing civil and criminal process, and often with limited judicial functions. His duties are generally defined by statute. In cities, as in English boroughs and counties, his functions have generally been transferred to the police (q.v.). See **PEACE**; **SHERIFF**; and consult: Bacon, *New Abridgment of the Law*, title

Constable (any edition); Dalton, *The Country Justice: Containing the Practice, Duty, and Power of the Justices of the Peace*.

CONSTABLE, ARCHIBALD (1774-1827). A Scottish publisher, born in Fifeshire. He became famous for the sumptuousness of his editions and the liberality shown toward his employees. He published nearly all of Sir Walter Scott's works, and his failure in 1826, with that of Ballantyne & Co., involved Scott for £120,000. Constable became publisher of the *Scots' Magazine* (1801), and of the *Edinburgh Review* (1802), and owner of the *Encyclopædia Britannica* (1812), which he enlarged. He edited the *Chronicle of Fife* (1810), and wrote a *Memoir of George Heriot* (1822). Consult: Constable, *Archibald Constable and His Literary Correspondents* (3 vols., Edinburgh, 1873); and Lockhart, *Life of Scott* (7 vols., London, 1838).

CONSTABLE, HENRY (1562-1613). An English poet. He was graduated from Saint John's College, Cambridge, in 1580; became a Roman Catholic, and therefore found it best to live mostly on the Continent. He died at Liège, October 9, 1613. He wrote many pretty pastorals and sonnets to Diana, sometimes marred by conceits, and decadent in tone. His one independent publication was *Diana* (1592; enlarged, 1594; reprinted in Arber's *English Garner*, 1877). He contributed four pastorals to *England's Helicon* (1600), and sonnets to other collections. Sixteen "Spiritual Sonnets," attributed to Constable, were first printed by T. Park in *Heliconia* (1815).

CONSTABLE, JOHN (1776-1837). An English landscape painter, the founder of modern landscape art. He was born on June 11, 1776, in East Bergholt, Suffolk, the son of a wealthy miller. His father intended him for the clergy, and afterwards tried him as a miller, but the youth's taste was all for art. He received his first instruction from a local amateur named Dunthorne, with whom he painted the scenes about his native home, always in the open air. In 1795 he went to London in order to study painting, but was recalled soon afterwards. In 1799 he returned to London and entered the Academy School, where he received instruction from Farrington and Reinagle. He was greatly impressed with the works of Ruysdael in the National Gallery. At first he attempted portraits and historical subjects, according to the custom of the day, but in 1803, weary of studying pictures and of acquiring truth second-hand, he returned to East Bergholt. From this time he painted landscapes from nature only, passing at least the summer months entirely in the country near his home.

His work, however, was too revolutionary and original to become popular in his native land, although he found a few devoted friends who believed in him and bought his pictures. Among these were Sir George Beaumont, the Mæcenas of his boyhood, Bishop Fisher, of Salisbury, and his nephew, Archdeacon Fisher. Constable's most intimate friend, and, above all, Miss Maria Bicknell, whom he afterwards married. He did not sell a single picture to a stranger until 1814, but was compelled to support himself by painting portraits and copies of paintings. But never discouraged, he worked on in his quiet way, knowing well that the future was his. At length



JOHN CONSTABLE

"THE HAY WAIN"

FROM THE PAINTING IN THE NATIONAL GALLERY, LONDON

he found recognition in France. In 1823 three of his pictures were exhibited at the Salon, where they excited the greatest admiration, and were accorded the place of honor in the exhibition. The King of France sent Constable a gold medal, and the same honor was accorded to him in the following year at Lille. At last, in 1829, came the tardy honor of membership in the Royal Academy, but accompanied by an ungracious remark on the part of the president, and too late to afford satisfaction to the painter.

Constable was a simple and noble character, who bore bravely discouragement and adversity, and never wavered in his ideal of art. His other great passion in life was his love for his wife, Miss Maria Bicknell, to whom, after many difficulties, he was secretly wedded in 1816. With a family of seven children, he was sometimes hard pressed for money, until he was at length relieved by his own inheritance and the ample inheritance of his wife. In 1827 he removed to his favorite Hampstead, where many of his best pictures were painted. He was greatly bereaved by the death of his wife in 1828, and died unexpectedly on March 30, 1837.

Constable was a great innovator in landscape painting, and he may be justly termed the father of the modern school. The old Dutch masters gained their effects by giving the forms of objects, placing more weight upon drawing than upon color, in which they achieved harmony by a uniform brown tone. Constable saw that landscape is rather a problem of light and air, and that its effect depends upon the light and shadow in which the objects are seen. He was the first to paint the subtle gradings of the atmosphere, and to show not only the objects themselves, but how he saw them. He laid on his colors fresh and fair, as they are in nature, applying to oil paintings the results of water-colors. His pictures are always harmonious in tone. He always gives the effect of a landscape, suppressing unimportant details—a tendency which increases with his later years. He frequently uses the palette knife, sometimes executing the entire picture by this means, as in the case of "Waterloo Bridge." In consequence of these teachings an able group of landscape painters arose in England in the forties and fifties, the most important of whom was David Cox (q.v.). But his greatest successors were the French painters of the Barbizon School, through whom his work has been transmitted to the landscape of the present day.

The National Gallery in London contains three of his finest works, the "Cornfield" (1826); "Valley Farm" (1835); and "Hay Wain." In South Kensington Museum are eight of his works, among which are "Deadham Mill" (1820); "Hampstead Heath" (1823); and "Water Meadows Near Salisbury." The Louvre has three good examples: "The Cottage," "Weymouth Bay" (1827), and the "Glebe Farm." Twenty of his chief works were published in 1833 in a series of fine and sympathetic etchings by his friend David Lucas, with an introduction by Constable himself.

Consult: Muther, *History of Modern Painting* (London, 1896), vol. ii.; Leslie, C. R., *Memoirs of Constable* (London, 1845), containing Lucas's plates; Chesneau, *La peinture anglaise* (Paris, 1882); Brock-Arnold, *Gainsborough and Constable* (London, 1881); Wedmore, *Studies in English Art* (London, 1876-80).

CON'STANCE (Ger. *Konstanz* or *Kostnitz*). A city of the Grand Duchy of Baden, situated on both banks of the Rhine, where it leaves Lake Constance, about 35 miles northeast of Zurich (Map: Germany, C 5). Remains of its ancient fortifications are still extant in the two old city gates. The cathedral, founded in the eleventh century, was rebuilt in the fifteenth century. The carved oak portals and choir-stalls are fine specimens of wood-carving. It was here that Huss was sentenced by the council to be burned at the stake. Other ecclesiastical buildings of interest are the Church of Saint Stephen and the Dominican monastery, on an island, in which Huss was confined, and now used as a hotel. The notable secular buildings include the old Kaufhaus, containing the hall in which the conclave of cardinals met to elect a pope at the time of the famous council in 1417; the Rosgarten, the former guildhall of the butchers, containing an interesting museum; and the town hall, with the city archives. Constance has manufactures of linen and cotton, carpets, soap, and chemicals. Population, in 1890, 16,235; in 1900, 21,345. Constance was known to the Romans at least as early as the third century. In 570 it was made the seat of a bishopric, which existed as one of the most powerful in Germany until its secularization in 1803. In 780 Constance was given municipal rights, and in 1192 was made a free imperial city. For joining the Schmalkaldic League it was deprived of its imperial privileges in 1548 and presented to Archduke Ferdinand of Austria. In 1806 it became a part of the Grand Duchy of Baden. Consult *Geschichte der Bischöfe von Konstanz* (Innsbruck, 1894-96).

CON'STANCE. (1) Daughter of the Emperor and eventually the wife of King Alla, in Chaucer's *Man of Law's Tale*. (2) The mother of Prince Arthur, in Shakespeare's *King John*. (3) Nonesuch's daughter, enamored of Lovely, in Dryden's *Wild Gallant*. (4) The heroine of Brome's *The Northern Lass*. (5) Fondlove's daughter and Wildrake's mistress, in Knowles's comedy *The Love Chase*. (6) The daughter of the Provost, later proved a serf, in G. W. Lovell's *Provost of Bruges*.

CONSTANCE, or CUSTANCE, DAME CHRISTIAN. A rich and beautiful widow in Udall's play *Ralph Roister Doister*.

CONSTANCE, COUNCIL OF. The sixteenth ecumenical Church council (1414-18) called by Pope John XXIII, at the suggestion of the Emperor Sigismund, to attempt to heal the Papal schism (see **SCHISM, WESTERN**), the scandal of which was then at its height; to deal with the Hussite heresy; and to consider measures for the general reform of the Church. It was the most brilliant and numerously attended Church council ever held. Dignitaries of Church and State, with large retinues, attended from all the countries of Europe; and many merchants and artisans, with a miscellaneous crowd, including showmen, players, and harlots, were attracted by the occasion. It is said that more than 18,000 priests, and in all about 100,000 strangers, were gathered in the city. The predominating influence of Pope John was nullified by a decision to vote by nations rather than by individuals, and it was proposed that all the three rival popes should abdicate. John fled from the city and attempted to dissolve the Council,

which then (April, 1415), under the lead of Jean de Gerson (q.v.), declared itself the highest authority of Christendom and above the Pope. John was deposed and condemned to imprisonment for life. Gregory XII. voluntarily withdrew, and Benedict XIII. was deposed and retired to Spain, where he spent the remainder of his life, without power or influence. The election of a new Pope was temporarily postponed. Huss was condemned after a turbulent trial, and burned at the city gate, July 6, 1415. Jerome of Prague was also condemned and perished at the stake, May 30, 1416. The movement for reform came to nothing. A beginning had been made, when the cardinals, with the help of the French, succeeded (November, 1417) in electing Otto Colonna (Martin V.) Pope, who brought the proceedings to an end with some slight concessions. Consult: Richtenthal, *Kronik des Konziliums in Konstanz* (Augsburg, 1533; new ed. Tübingen, 1882); Leufant, *History of the Council of Constance* (Eng. trans., London, 1730); Finke, *Forschungen und Quellen zur Geschichte des Konstanzer Konzils* (Paderborn, 1889). See JOHN XVIII.; GREGORY XII.; BENEDICT XIII.; MARTIN V.; HUSS, JOHN; JEROME OF PRAGUE.

CONSTANCE, LAKE (named from the city of *Constance*, Ger. *Konstanz*, or *Kostnitz*, Lat. *Constantia*; German *Bodensee*, formerly *Bodemsee*, *Bodnensee*, *Bodmansee*, from the castle of *Bodman* on its shores, ML. *Lacus Podamicus*, *Mare Podanum*, Lat. *Lacus Brigantinus*, *Lacus Venetus et Acronius*). A lake of glacial origin, situated at the north base of the Alps and forming a portion of the boundary between Switzerland and Austria (Vorarlberg) on the south, and the German States of Baden, Württemberg, and Bavaria on the north (Map: Switzerland, D 1). It is on the course of the Rhine, which enters from the south and flows out in a westerly direction. Lake Constance extends northwest and southeast, and at its northwest end forks into a northern prolongation known as Ueberlinger See, which has a broad connection with the main lake; and into a southern fork, called the Lower Lake (Untersee), formerly known as the Zeller See, connected with the main lake by a narrow channel, 600 to 1600 feet wide, and only two and one-half miles long. The outlet of the lake is at the foot of this arm. The height of its surface is about 1300 feet above sea-level; the length of the lake is about 40 miles; the greatest breadth about nine miles; the length of shore line 160 miles, and the area 208 square miles. The greatest depth is 906 feet. The water of the lake is subject to sudden rises of from three to twelve feet, due to the melting of the snows. While the Rhine from the south is the main affluent, a number of minor streams discharge into the lake, nearly all of them on the northeast side. Among these tributaries are the Bregenz Ach, Leblach, Argen, Schussen, Steinach, Ach of Uhlhingen, and Stoekach.

The lower lake is covered with ice nearly every winter, but it is only rarely, in an extreme winter, that the surface of the main lake becomes frozen. The lake contains twenty-six varieties of fish, among them salmon and salmon trout, and twenty-two species of shell-fish. The shores are hilly and picturesque. The land is productive and in great part under cultivation, but extensive woodlands still remain. Lake Con-

stance formerly extended much farther south than at present, and even within historic times, in the fourth century, it extended as far as Rheineck (Rheinegg). The towns on the shores of Lake Constance are Bregenz, Lindau, Friedrichshafen, Ueberlingen, Constance, Arbon, and Rorschach. Steamboats navigate the lake, and railways follow its shores.

CON'STANS. In the old romances, a King of Britain, and grandfather of Arthur.

CONSTANS, FLAVIUS JULIUS. A Roman Emperor (A.D. 337-50). He was the youngest son of Constantine the Great (by Fausta), and was born A.D. 323 (or 320). He was made Crown Princee (*Cæsar*) in 333, and became Emperor together with his brothers Constantine and Constantius, on the death of their father in A.D. 337. Constans received the government of Italy, Illyricum, and Africa. In 340, however, war broke out between the brothers and Constantine was killed near Aquileia. Constans now ruled also his brother's dominions. He was killed by a soldier of the self-proclaimed Emperor, Magnentius, January, 350.

CONSTANS, KÖN'STÄN', JEAN ANTOINE ERNEST (1833—). A French statesman, born at Béziers. He was appointed Under-Secretary of State in the Freycinet Cabinet in 1879, and was Minister of the Interior in the Freycinet and Ferry Cabinets (1880 and 1881). After serving for one year as Governor-General of Indo-China, he was compelled in 1887 to resign this position as incompatible with his duties as a Deputy. From 1889 to 1892 he was again Minister of the Interior (in the Cabinets of Tirard and Freycinet), and during this period his vigorous measures served to overthrow Boulangism. In 1887 he was elected to the Chamber of Deputies, and in the following year received an appointment as Ambassador to Constantinople.

CONSTANT, KÖN'STÄN', JEAN JOSEPH BENJAMIN (1845-1902). A French painter, born in Paris, June 10, 1845. In 1866 he obtained a municipal prize entitling him to free instruction in the Ecole des Beaux-Arts, and he was besides this a pupil of Cabanel. In 1872 he went to Morocco, where he painted a series of Oriental scenes, which brought him great reputation. Among his chief works of this character are the "Last Rebels" (now in the Luxembourg Gallery), and the "Thirst," and "Les Chérifas." His large canvas, "The Entrance of Mahomet II. into Constantinople," received a medal in 1876. All these works show him to be a fine colorist and a master of technique. After 1880, however, he changed his manner, devoting himself to mural decorations and to portraits. The most prominent examples of the former are a great plafond in the Hôtel-de-Ville, Paris, entitled "Paris Convoking the World," and his paintings in the New Sorbonne, representing "Literature," "The Sciences," and the "Academy of Paris." He painted important mural decorations in other cities of France, and was equally distinguished as a portrait painter. A good example of his portraiture is "Mon Fils André," which took the medal of honor at the Salon in 1896. Constant was made Officer of the Legion of Honor in 1894, and died on May 26, 1902. He visited the United States several times, and painted a number of portraits, now in private possession. The Metropolitan Museum of New

York possesses a large mural decoration by Constant representing "Justinian in Council." Constant was also a writer of repute, having contributed a number of good studies on contemporary French painters. Consult Stranahan, *Modern French Painters* (New York, 1893).

CONSTANT'A. See KÜSTENDJE.

CONSTANT DE REBECQUE, kōn'stān' de rā'bēk', HENRI BENJAMIN (1767-1830). A distinguished French politician and novelist, born at Lausanne, October 23, 1767. His family was Protestant, and had taken refuge in Switzerland from religious persecution. Till thirteen, Constant studied at Lausanne, then successively at Oxford, Erlangen, and Edinburgh, laying the foundations of a cosmopolitan culture that explains his affinity for Madame de Staël. He was a moderate Republican during the Revolution, and after 1795 settled in Paris, where his political writings, especially his pamphlet, *De la force du gouvernement actuel de la France*, attracted great attention. In 1799 Bonaparte called him to the tribunate, but he opposed the First Consul's attack upon constitutional rights, and was exiled in 1802. His political career thus checked, he turned to literature, and accompanied Madame de Staël, like him an exile, on her travels. At Weimar he learned to know Goethe and Schiller. He translated, or rather adapted, the latter's *Wallenstein*. He also wrote *Adolphe* (1816), a literary result of his relations to Madame de Staël, who had put her experience with him into *Delphine*: This sole novel of the versatile politician is a clear, keen, relentless analysis of the mutual degradation resulting from ill-assorted matings. It is brief, almost cruelly simple, and told in a style as precise and dry as that of a mathematical demonstration. Chivalrous toward Madame de Staël, he is pitiless to himself, to his father, to his former love, Madame de Charrière, and to their officious friend, Madame Récamier. Constant's *Correspondence*, his *Journals*, all that we know of his life, show him, as he reveals himself here, always seeking emotion, never attaining to passion. With this novel still unpublished, he returned to France after Napoleon's first abdication (1814), with the prestige of his stirring pamphlet *De l'esprit de conquête et de l'usurpation* (1813). He hoped to find the Restoration more favorable to constitutional liberty than Napoleon's 'government of mame-lukes,' but he was soon undeceived. During the Hundred Days, he cooperated with the returned Emperor, and assisted in drawing up the *acte additionnel* to the Constitution. After Waterloo he retired to England, but was permitted to return to France in 1816. He joined the liberal writers of the day, and was elected Deputy in 1819. He became the acknowledged leader of the opposition to Charles X., and the most brilliant champion of a constitutional monarchy. He deplored the violence of the Revolution of July, which occurred while he was convalescent in the country. At the request of Lafayette he returned, and for the few months that remained to him of life supported the Government of Louis Philippe and the principles to which his political life had been dedicated. He died at Pau, December 8, 1830. Constant was not a graceful speaker, but a singularly effective writer. His speeches are collected as *Discours* (2 vols., 1828); his essays on representative government as *Cours de politique constitutionnelle* (4 vols., 1817-20).

He wrote also *Mémoires sur les Cent Jours* (1820), and *De la religion considérée dans sa source, ses formes, et ses développements* (1824-31), in which he undertook to show that the religious instinct remained essentially unaffected through all changes of dogma and forms. In teaching that Christianity had "introduced moral and political liberty into the world," he widened the breach with the thought of the eighteenth century shown and in part caused by the *Génie du Christianisme* of Chateaubriand. "Lucian was incapable of understanding Homer," he said; "Voltaire has never understood the Bible." Consult: Faguet, *Politiques et moralistes* (Paris, 1898), and Sainte-Beuve, *Nouveaux Lundis*, vol. i. (Paris, 1863), and *Portraits littéraires*, vol. iii. (Paris, 1864).

CONSTANTIN, kōn'stān'tān', ABBÉ. The lovable, benevolent old parish priest in Ludovic Halévy's graceful romance *L'Abbé Constantin* (1882), a revulsion from the sensational work of the naturalistic school. It tells the simple story of the good abbé and his old housekeeper, the wealthy American woman who becomes his collaborer in good works, and her sister, who falls in love with a young lieutenant. A successful comedy under the same title was adapted from the romance by Crémieux and Decourcelle, and presented at the Gymnase in 1887.

CONSTANTINA, kōn'stān-tē'nā. A town of Spain, in the Province of Seville, about 40 miles north-northeast of Seville (Map: Spain, C 4). It is in a mountainous region, and has silver and lead mines, lumbering interests, distilleries, and tanneries. Population, in 1901, 9687.

CONSTANTINE, kōn'stān-tēn'. A fortified city and a Catholic episcopal see, the capital of Constantine, the easternmost department of Algeria (Map: Africa E 1). It is situated on a precipitous hill with a flat summit, three sides of which are washed by the Rummel, flowing through a deep and narrow ravine. The fourth and west side is connected by a natural mound with the surrounding mountains. It is 830 feet above the river and 2162 feet above the sea. It is surrounded by walls constructed by the Arabs out of Roman sculptured stones. The streets in the Moorish or older portion of the town are narrow and dirty, and the houses mean. The chief ancient buildings are the Kasba, or citadel, of Roman construction; the palace of the Bey; the harem of Salah; and three mosques, one of which, Suk-er-Rezel, dating from 1143, is now the Christian Church of Notre Dame des Sept Douleurs. The modern and French portion of the town is marked by wide streets and open squares. Its principal buildings include the Palais de Justice, administrative buildings, the Protestant church, and theatre. The Mohammedans support a medreso, or religious seminary, and the French Government maintains a college and other educational institutions for Arabic and European culture. There are an archaeological society and museum of local antiquities. The town has manufactures of woolen cloths, saddlery, and other articles in leather, and a considerable grain trade with Tunis. Its seaport for foreign trade is Philippeville, 50 miles to the northeast, with which and the principal towns of Algeria it is connected by rail. Constantine, anciently one of the most important towns of Numidia, called Carta by the Carthaginians,

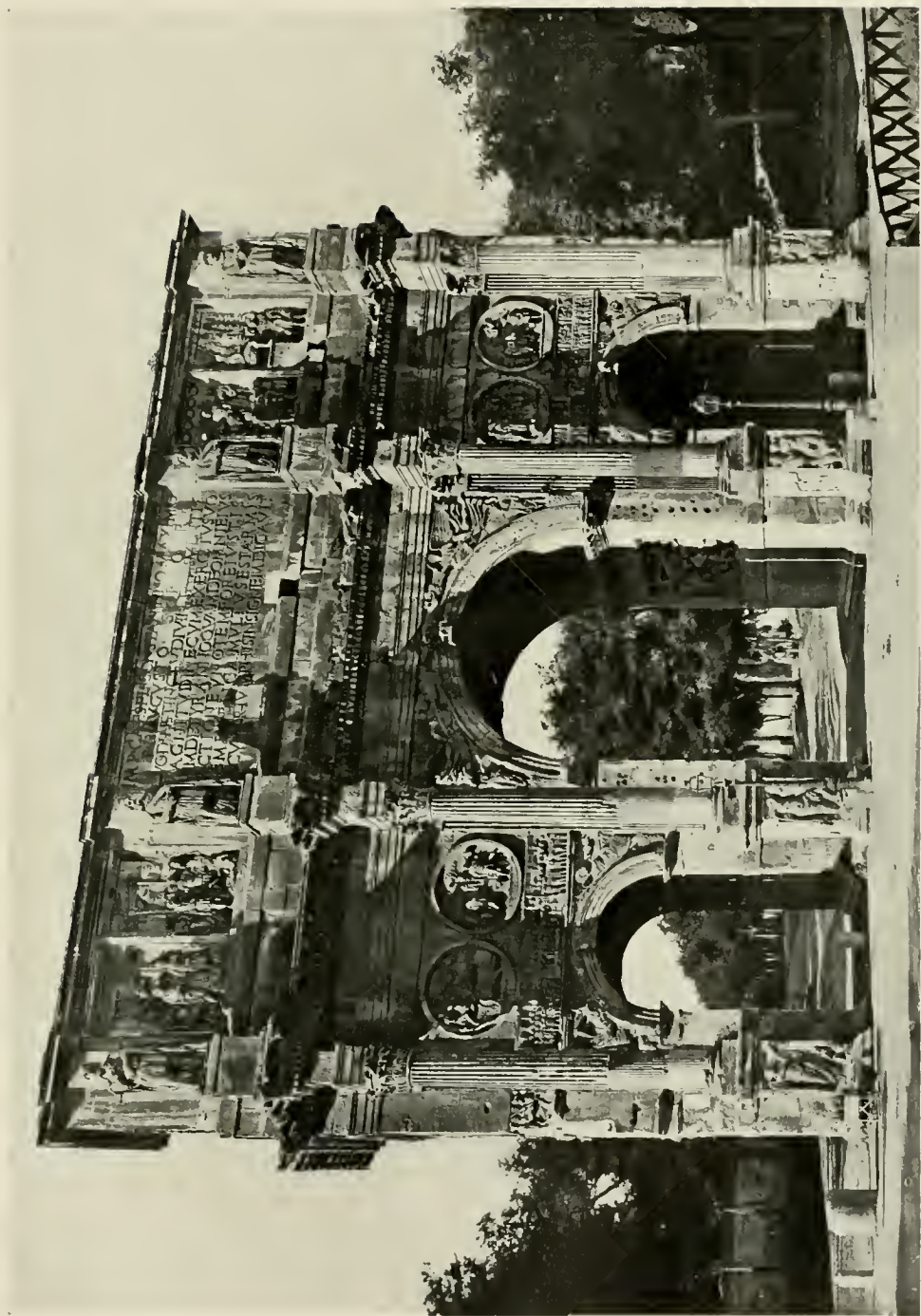
and Cirta by the Romans, was a royal residence. It was destroyed in the wars of Maxentius against Alexander, about A.D. 311, but was soon rebuilt by Constantine the Great, from whom it derives its present name. It was a flourishing town in the twelfth century, its commercial relations extending to Venice, Genoa, and Pisa. Subsequently it shared in general the fortunes of Algeria. The French captured it by assault, after a long siege, in 1837. Population, in 1901, 48,911, including 15,096 French residents.

CONSTANTINE. The name of two popes.—**CONSTANTINE I.** (Pope 708-15). His pontificate was marked by the submission of Felix, Archbishop of Ravenna, to the supremacy of Rome, and by his voyage to Constantinople, at the invitation of Justinian II., to confirm the decrees of the Quinisextan Council, which his immediate predecessor had refused to do.—**CONSTANTINE II.** (Pope 767-68). He was forced into the see by his brother, Duke Toto of Nepi, but within a few months was overthrown and blinded by an opposing faction, his deposition being solemnly confirmed by the Lateran Synod of 769, which laid down the rule that the Pope must be chosen from the College of Cardinals.

CONSTANTINE I., FLAVIUS VALERIUS AURELIUS CONSTANTINUS, surnamed 'the Great,' A Roman Emperor (A.D. 306-337). He was born soon after A.D. 270, at Naïssus, in Mœsia. He was the eldest son of Constantius Chlorus, and first distinguished himself by his military talents under Diocletian, in that monarch's famous Egyptian expedition (296); subsequently he served under Galerius in the Persian War. In 305 the two emperors, Diocletian and Maximian, abdicated, and were succeeded by Constantius Chlorus and Galerius, who could not endure the brilliant and energetic genius of Constantine, took every means of exposing him to danger, and it is believed that this was the period when he acquired that mixture of reserve, cunning, and wisdom which was so conspicuous in his conduct in after years. At last Constantine fled to his father, who ruled in the West, and joined him at Boulogne just as he was setting out on an expedition against the Piets in North Britain. Constantius died at York, July 25, 306, having proclaimed his son Constantine his successor. The latter now wrote a conciliatory letter to Galerius, and requested to be acknowledged as Augustus. Galerius did not dare to quarrel with Constantine, yet he granted him the title of Cæsar only. Political complications now increased, and in a short time no fewer than six emperors were 'in the field'—viz.: Galerius, Licinius, and Maximin in the East, and Maximian, Maxentius (his son), and Constantine in the West (A.D. 308). Maxentius, having quarreled with his father, forced him to flee from Rome. He took refuge with Constantine, but was ungrateful enough to plot the destruction of his benefactor. This being discovered, he fled to Marseilles, the inhabitants of which city gave him up to Constantine, who put him to death (A.D. 309). Maxentius professed great anger at the death of his father, and assembled a large army, with which he threatened Gaul. Crossing the Alps by Mont Cénis, Constantine thrice defeated Maxentius—first near Turin, then under the walls of Verona, and finally near

the Milvian Bridge at Rome, October 27, 312, Maxentius himself, in the last of these engagements, being drowned in an attempt to escape across the Tiber. It was during this campaign that he was said to have had the apparition in the sky of a luminous cross with the words *Hoc signo vinces*, "by this sign shalt thou conquer," as the contemporary historians Eusebius and Lactantius record. Constantine now entered the capital, disbanded the pratorians, and adopted other judicious measures for allaying the public excitement. He was honored with the title of Pontifex Maximus, or supreme dignitary of the pagan hierarchy.

Constantine was now sole Emperor of the West. Similarly, by the death of Galerius in 311 and of Maximin in 313, Licinius became sole Emperor of the East. In 314 a war broke out between the two rulers, in which Licinius was worsted and was fain to conclude a peace by the cession of Illyricum, Pannonia, and Greece. Constantine gave Licinius his sister Constantia in marriage, and for the next nine years devoted himself vigorously to the correction of abuses in the administration of the laws, to the strengthening of the frontiers, and to chastising the barbarians, who learned to fear and respect his power. In 323 war was renewed with Licinius, who was defeated and ultimately put to death. Constantine was now at the summit of his ambitions—the sole governor of the Roman world; but Rome was no longer the political or geographical centre of this world, and he determined to move the capital to Byzantium, which he solemnly inaugurated in 330 under the name of Constantinopolis, the City of Constantine. From here he ruled his vast empire until his death, which occurred May 27, 337. From the reign of Constantine, Christianity was not only recognized and tolerated, but became the religion of the rulers themselves. As to Constantine's personal feeling in the question of Christianity and paganism much has been written. By birth and education he was much inclined toward the growing faith; his mother was a Christian, and his father Constantius, though a pagan, was very tolerant, and would allow no direct acts of violence in his part of the Roman domain during the great persecution of 303. Constantine was by nature mild and kind-hearted; his legislation was governed by humane principles. He abolished the system of branding the faces of convicts; ordained that masters who killed their slaves were guilty of homicide, and published an edict of toleration which insured liberty of conscience throughout the Empire. The Christians were as yet but a minority of the whole population, but the Emperor openly sympathized with them and did not hesitate, upon occasion, to insult the pagans. Yet his Christianity was not deep-seated, though doubtless quite sincere as far as it went. He looked upon his overthrow of Maxentius as due to the help of God, *instinctu divinitatis*, as the inscription on his arch in Rome (see **CONSTANTINE, ARCH OF**), built in 315, shows; but the very form of expression displays a concession to pagan sensibilities that a rigorous Christian of the period would not have made. He retained the traditional pagan title of Pontifex Maximus, as did his Christian successors of the fourth century, and his coins still bear the figures and names of the old gods. In the Arian controversy he sided with the Catholic bishops,



THE ARCH OF CONSTANTINE

and it was he who called the great Council of Nicæa (Nice) in Bithynia in 325 (see NICE, COUNCIL OF), and presided at the first sitting. By this council the doctrine of consubstantiality was defined, and the Nicene creed was adopted; but Constantine took no active part in the discussion. He did not receive baptism until shortly before his death.

CONSTANTINE II., or JUNIOR, FLAVIUS CLAUDIUS CONSTANTINUS. A Roman Emperor (A.D. 337-40). He was the eldest son of Constantine the Great, and was born A.D. 317, at Arelate (Arles), in Gaul. He became joint Emperor with his brothers, Constantius and Constans, on the death of their father, in 337, receiving Gaul, Britain, Spain, etc., as his share of the Empire. In 340 he invaded the dominions of Constans, and was killed in the battle of Aquileia (A.D. 340).

CONSTANTINE VII., PORPHYROGENITUS (905-59). A Byzantine Emperor. He became, at the age of six, associate Emperor with his father, Leo VI., at seven the associate of his uncle, and at eight sole ruler; but in reality he was the ruler only after the death of his father-in-law, Romanus (q.v.), in 944. Even then, he paid more attention to literature than to State affairs, leaving the latter to his wife Helena. It is reported that he was poisoned by the wife of his son Romanus, who was his successor. He wrote a life of his grandfather, Basil I., and a number of political works, including: *On the Themes*; *On the Ceremonies at the Court of Constantinople*; and *On the Administration of the Empire*. Some of his works are published, in three volumes, in the Bonn edition of the Byzantine Historians. Consult: Krumbacher, *Geschichte der byzantinischen Litteratur* (Nördlingen, 1891); Rambaud, *L'empire grec au Xe siècle*; *Constantin Porphyrogénète* (Paris, 1869).

CONSTANTINE XI., PALEOLOGUS (1404-53). The last of the Byzantine emperors. He was the son of the Emperor Manuel II., and from 1427 to 1446 was engaged in almost continuous warfare against the Frankish princes of the Peloponnese. His brother, the Emperor John VIII., died in 1448, and Constantine became Emperor. He entered Constantinople in 1449, and showed himself an intelligent, brave, and resolute ruler, but his position was a hopeless one. Mohammed II. was preparing for the final assault on Constantinople, and Constantine appealed in vain to the princes of Christendom. A long siege preceded the capture of the city, which was finally accomplished May 29, 1453. In the desperate battle waged at the gates of the city Constantine fell, slain by some unknown hand. Mohammed gave his body honorable burial. Consult Miyatovitch, *Constantine, the Last Emperor of the Greeks* (London, 1892). See BYZANTINE EMPIRE.

CONSTANTINE, KONSTANTIN NIKOLAYEVITCH (1827-92). A Grand Duke of Russia, the second son of Emperor Nicholas I. and brother of Alexander II. He was grand admiral of the Russian fleet, and, in addition, held numerous military offices. During the Crimean War he commanded the Russian fleet in the Baltic, and directed the defensive preparations which held the English and French armaments in check before Cronstadt. He earnestly supported his brother's liberal reform plans, and endeavored in many ways to promote the cause of enlightenment in Russia. He was appointed Governor of

Poland in 1862, but failed in his attempts to reconcile the Poles, and resigned soon after the outbreak of the Revolution in 1863. In January, 1865, he was appointed president of the Council of the Empire. On the accession of his nephew, Alexander III., he was deprived of most of his offices, and soon retired altogether from public life.

CONSTANTINE, KONSTANTIN PAVLOVITCH (1779-1831). A Grand Duke of Russia, the second son of the Emperor Paul I. After the Congress of Vienna, the government of the newly created kingdom of Poland was intrusted to him by his brother, the Emperor Alexander I. In January, 1822, on his divorce and remarriage out of the ranks of royalty, he executed a private deed by which he resigned his claims to the throne in the event of Alexander's death, and, when that event took place in 1825, he adhered to this resignation, although he had meanwhile, in his absence, been proclaimed Emperor in Saint Petersburg. The succession thus fell to his younger brother Nicholas. The character of Constantine's administration in Poland was not such as to conciliate any class of the people, and a widespread conspiracy was formed. The Revolution of July (1830) in France supplied the spark which was needed to kindle the revolution in Poland, and he was obliged to flee for his life. He died soon after of the cholera.

CONSTANTINE (1868—), Duke of Sparta, Crown Prince of Greece. He was born in Athens, and studied at the universities of Berlin and Leipzig. In 1889 he married the Princess Sophia of Prussia, sister of Emperor William II. He was appointed commander-in-chief of the Greek troops operating against the Turkish forces under Edhem Pasha, in Thessaly, in March, 1897, and conducted the retreat from Dhomokos in May of that year. See GREECE; TURKEY.

CONSTANTINE, ARCH OF. A famous arch at Rome, between the Palatine and Cælian hills, southwest of the Coliseum, at the junction of the Sacred and Triumphal ways. It was erected in A.D. 315, to commemorate the Emperor Constantine's victory over Maxentius. The arch is the best-preserved ancient monument of Rome, probably because the fact that its builder was a Christian Emperor saved it from destruction during the devastations of the Middle Ages. It has three openings and four columns on each face. Little more than the brickwork was contemporary with Constantine, the marble facing, the statues of the Dacian kings, the eight columns, and the entablature having been taken from other buildings, especially from a destroyed arch of Trajan.

CONSTANTINE, BASILICA OF. A vast basilica begun by Maxentius and completed by Constantine, on the site of a former market at Rome. It had a nave over 100 feet high and 80 broad, supported on eight white marble columns, of which one is now standing in front of the Church of Santa Maria Maggiore. The entrance, originally facing the Coliseum, was later changed to the north, facing the Sacred Way. The preserved portions of the basilica have served as a cattle-shed, a riding-school, a hayloft, and a drilling-place for recruits. The vaulting of the south aisle is still standing.

CONSTANTINE, BATHS OF. Enormous baths built by Constantine, covering nearly the whole breadth of the Quirinal Hill, in Rome. The only extant remains are some foundations seen in excavating the Via Nazionale, and a few blocks of marble now in the adjoining Colonna Gardens. The baths were demolished by Paul V., in 1610, and their site is now occupied by the Quirinal and Rospigliosi palaces. The figures known as the "Horse Tamers," from which Monte Cavallo is named, stood in front of the baths, and here was found the colossal statue of Constantine.

CONSTANTINOPLE (Lat. *Constantinopolis*, from Gk. *Κωνσταντινου πόλις*, *Konstantinou polis*, city of Constantine, Turk. *Istanbul* or *Stambul*, from Gk. *εἰς τὴν πόλιν*, *eis tēn polin*, or, in the corrupted dialect of the people, *εἰς τὰ μὲν βόλιν*, *es tam bolin*, to the city). The capital and largest city of the Ottoman Empire, situated in the extreme southeastern part of European Turkey, on the shores of the Sea of Marmora, the Bosphorus, and the Golden Horn, a long, narrow inlet, extending in a northwestern direction from the Bosphorus; latitude 41° N., longitude 28° 59' E. (Map: Turkey in Europe, G 4). With its many mosques, kiosks, and extensive gardens, it presents from the sea a magnificent appearance, which is greatly enhanced by the imposing picturesqueness of the situation. Constantinople proper, or Stambul, occupies a triangular peninsula. The suburbs of Galata and Pera are situated on the northern and opposite shore of the Golden Horn, which is spanned by two iron pontoon bridges. Stambul is surrounded by partly ruined walls, the most famous of which is the Theodosian double wall dating from 447. The fortifications have strong towers, and are pierced by numerous historic gates. The streets are narrow, crooked, and without sidewalks. There are countless house-gardens and many beautiful cemeteries. The houses, usually of one story, are mostly built of wood, though some portions of the city, since the great fires of 1865, 1866, and 1870, have been reconstructed in a modern fireproof style. Many fine public buildings have latterly been erected; new suburbs have been built, and old ones enlarged and improved. On the whole, however, the rate of growth and the extent and character of the improvements of the city are surpassed in nearly every other European capital.

The architectural beauty of Constantinople itself lies conspicuously in its mosques, 379 in number, among which that of Agia Sofia (originally the Church of Saint Sophia) is most famous. The present edifice, 250 by 235 feet in size, was begun in 532 by Justinian, and was completed in five years. It is constructed of brick, faced with marble. Its shape is that of a cross. While its outward appearance is not in keeping with the grandeur and charm of its interior, it is regarded as one of the most magnificent of ecclesiastical edifices. The dome in the centre rises 180 feet high (from the ground), and is 108 feet in diameter. It is supported by four arches. Within the mosque are 107 pillars of gigantic proportions—40 on the ground floor and 67 above. They are of green marble and red porphyry, with capitals in the Byzantine style. The walls were originally decorated with beautiful mosaics, which have been either partly effaced or partly covered up with inscriptions from the Koran. After the

conversion of the church into a mosque by Mohammed II., in 1453, four minarets were added, and the golden cross on the dome was replaced by the crescent.

The Mosque of Solyman covers a site nearly as large as that of Saint Sophia, and, like most mosques, is surrounded by a well-shaded court. It was built in 1550-66, by the Sultan Solyman. It has four minarets, and is surmounted by a dome somewhat higher than that of Saint Sophia. The marble decorations in the interior are magnificent. The Mosque of Achmet I. was built in 1609-14, and exceeds in dimensions the Mosque of Solyman, but is inferior to the latter in design and in ornamentation. Among other mosques may be mentioned those of Mohammed II., Bajazet II., Selim I., Yani-Jami, and Mur-i-Osmani.

Secular buildings of historic interest are: The Castle of the Seven Towers, once a State prison where a number of dethroned sultans were executed; the hippodrome, completed by Constantine, the scene of public festivals as well as of popular uprisings; and the old Scraglio, with its extensive gardens and beautiful kiosks and palaces. There are also interesting ruins of ancient royal palaces. The present abode of the Sultan, the Serai Humayun, is in reality a little city whose walls inclose mosques, administrative buildings, dwelling-houses and gardens. It is over a mile and a half in circumference. In royal grandeur, however, it does not equal the residences of many other European rulers. Its outer gate is called 'The Sublime Porte.'

The bazaars of Constantinople are very numerous. The chief of them, the Grand Bazaar, somewhat injured by an earthquake in 1894, occupies a large number of narrow, vaulted alleys, and contains about 3000 shops. It is filled with merchandise of great variety and beauty, and presents in daytime one of the finest sights of the city. The bazaars, however, are gradually losing their importance, the wealthier classes preferring to make their purchases in the French shops on the Grande Rue in Pera.

Galata, situated on the eastern shore of the Golden Horn, is the business port of Constantinople. Here are found the warehouses, banking houses, exchanges, and the custom-house. The town is built of stone, and the streets in some sections are new and regular. The Galata Tower, formerly known as the Tower of Christ, is 150 feet high, and is divided into several stories and surrounded by galleries. It serves as a fire-signal station.

Pera, the foreigners' quarter and the most modern part of Constantinople, lies beyond Galata. Here are the foreign embassies and the residences of the Europeans. Here also is the Grande Rue, lined with fashionable shops and hotels. Pera has a fine park, barracks, and several cemeteries which are occasionally used as festival grounds.

Administration.—As to government, Constantinople, including the town of Scutari across the Bosphorus, forms a separate district, under the administration of a prefect. It is probably the only city in Turkey where the police force is not recruited from the regular army. The fire department is utterly inadequate, and the system of alarms used is most primitive. Systematic street-cleaning is attempted only in the European section of the city. In the native

quarters the dogs are the principal scavengers. The water-works of Constantinople, dating in part from the reigns of Justinian and Valens, are regarded among the finest remaining specimens of ancient engineering. Some of the cisterns are the largest in the world; the roof of one of them is supported by 336 marble columns. The water comes from the reservoirs of Belgrade, and also from Lake Berkos, the latter source of supply being exploited by a French company.

The numerous elementary public schools are attached to the mosques and offer instruction free. Colleges, or 'medresses,' some 150 in number, with public libraries, are found in connection with the principal places of worship. A university was opened in 1900, with faculties of philosophy, Mussulman theology, mathematics, law, and medicine. The Imperial Art School is not without importance. The French conduct several schools for the children of the wealthier classes. Many of the libraries are filled with valuable volumes and manuscripts. Within the inclosure of the Seraglio is the Royal Museum of Antiquities, containing a fine collection of curious tombstones, sarcophagi, Turkish art objects, natural-history specimens, etc. The benevolent institutions are to be counted by the score; indeed, almost every craft has a benevolent guild.

The industrial importance of Constantinople is not great. The few large establishments manufacture tobacco products, fezzes, and iron wares. The hand-made products, on the contrary, are important, both as regards variety and quantity; and to the trade in these small articles the life of the city lends itself most interestingly, with its bustling little shops, its noisy street traffic before the mosques, and its curious and picturesque trade customs. The geographical position and natural harbor facilities of Constantinople are unsurpassed. The Golden Horn affords accommodation for over 1000 vessels of the heaviest draught. It is divided by its two bridges into the outer and inner ports of trade, and the port of war.

Not until 1888 did the city have railway connection with the rest of the world. Since the establishment of direct steam communication between Persia, Syria, Arabia, and Southern Europe, and the opening up of Central Asia by Russia, Constantinople has lost a considerable part of its commerce. Important imports are food products, textiles, coal, metalware, instruments and implements of all kinds, petroleum, and wood. The exports are largely confined to carpets and rugs, lambskins and wool, attar of roses, embroideries, and filigree-work. The annual entrances and clearances of shipping comprise about 14,500 vessels, with a tonnage of about 10,500,000. Of these about 11,000 represent foreign trade. The number of Turkish vessels is over 6000, but their total tonnage is comparatively light. For local transportation there are omnibuses, four horse-car lines, and one underground cable road. The Constantinople-Adrianople line has several stations within the city limits. Small steamers and ferries ply between Stambul and Galata.

The population of Constantinople proper numbers about 650,000. This figure is increased to over 1,100,000 by including the suburbs. In the city proper nearly two-thirds of the population are Mohammedans.

History.—In A.D. 330 the Roman Emperor Constantine the Great gave the name Constantinople to the new capital which he had built for himself on the Bosphorus round the ancient Byzantium as a nucleus. The presence of the Emperor made Constantinople from the first distinctively the capital of the Greek civilization in the eastern part of the Roman Empire, as Rome remained the head of the Latin civilization in the West. From the final disruption of the Roman Empire in 395 to 1453, the city was the capital of the Byzantine or Eastern Empire. The Patriarch of Constantinople gradually rose to the position of head of the Christian Church in the East. In the course of years, as the imperial provinces in Asia and Africa, with the great metropolises of Antioch and Alexandria, fell into the hands of the Mohammedans, the Christian culture of the East found refuge in Constantinople, and Byzantinism—a blending of the ideas of Oriental despotism with the Roman conception of the State—found its home there. In the struggle between Latin and Eastern Christianity, Constantinople naturally was the great opponent of Rome, and, as the champion of inflexible orthodoxy, it welcomed the great schism of 1054, which disrupted the Catholic Church. The strategic position of the city at the meeting-place of two continents exposed it to attacks from numerous nations—Avars, Arabs, Bulgars, Varangians, Venetians, and the Latin powers of Western Europe, and finally the Turks. It was besieged more than thirty times, and its walls were repeatedly assaulted; but it was taken thrice only—by the Venetians and Crusaders in 1203 and 1204, and by Mohammed II., after a memorable siege, on May 29, 1453. The prosperity of the city sank during the period of the Crusades, when its lucrative commerce was diverted to the Italian towns. Its capture by the Turks marks an epoch in European history, for the scholars and rhetoricians who fled from Constantinople brought back to Western Europe the knowledge of the ancient Greek literature, and by their contribution to the revival of learning fostered the Renaissance and the Reformation. In more recent times Constantinople has been important as a storm-centre in the play of international politics known as the 'Eastern Question.' In 1878 the Russian armies advanced to the fortifications of the city.

Consult: Grosvenor, *Constantinople* (Boston, 1895); Hutton, *Constantinople* (London, 1900); Dwight, *Constantinople and Its Problems* (New York, 1901); Barth, *Konstantinopel* (Leipzig, 1901).

CONSTANTINOPLE, COUNCILS OF. Eight councils which are recognized as ecumenical either by the Greek or Latin Church, or by both, were held at the city of Constantinople. The first was the second ecumenical council of the Church, convened in 381 by the Emperor Theodosius I. It consisted of 150 bishops, chosen under the dictation of the Emperor and chiefly from the East, besides the semi-Arians, followers of Macedonius of Constantinople, who withdrew after their opinions had been condemned. This council condemned also the Arians, Eusebians, and Eudoxians; it reaffirmed the resolutions of the Council of Nice, completed the definition by that council of the divinity of the Holy Ghost, and declared that the Bishop of

Constantinople, or new Rome, was, of right, next in rank to the Bishop of old Rome; both of them being alike subject only to the Emperor. The *second* was the fifth ecumenical council of the Church, convened in 553 by Justinian I. to sustain his condemnation of three distinguished teachers of the Antiochian school—viz. Theodore of Mopsuestia, Theodoret, and Ibas of Edessa—whose opinions had been collected into ‘three chapters.’ (See CHAPTERS, THE THREE.) There were 165 bishops, mostly Eastern, in attendance. They condemned the ‘three chapters’ and renewed the condemnation of the doctrines of Nestorius. Pope Vigilius, though not present, afterwards sanctioned the condemnations. The *third* was the sixth ecumenical council, held in 680-81, and consisting of 289 bishops. Through the influence of the Roman legates, the council condemned the doctrine that “as there was only one Christ, so He had only one will,” and recognized in Him, consistently with the doctrine of two natures in one person, two wills made one by the moral subordination of the human to the divine. The *fourth* was the council held in 692, by command of Justinian II. It is recognized as ecumenical only by the Greeks, and is called ‘*quinisextum*,’ because it supplemented the fifth and sixth. It passed more than one hundred canons concerning the morals of the clergy and Church discipline. The *fifth* was held in 754, and attended by 338 bishops. It is recognized only by the Greeks, and is called ‘the Mock Synod’ by Hefele. It issued a decree against image-worship, which was revoked in 787 by the second ecumenical council of Nice. The *sixth* was held in 869-70, and is recognized only by the Latin Church. It was attended by upward of 60 bishops. It deposed the patriarch Photius, restored Ignatius, and enacted laws concerning Church discipline. The *seventh* was held in 879, and is called by the Greeks the eighth ecumenical. There were 383 bishops present. It recalled Photius, repealed the action of the preceding council against him, and defined the position of the patriarch of Constantinople in relation to the Pope. The *eighth* was held in 1341, and is called by the Greeks the ninth ecumenical. It condemned Barlaam, an educated monk, as heretical in opposing the Hesychasts, a mystical sect among the monks of Mount Athos, who asserted the possibility of attaining, while yet in the body, an intuition of the divine light and essence by a perfect cessation of corporeal life.

CONSTANTIUS I., kōn-stān’shī-ūs, FLAVIUS VALERIUS. A Roman Emperor (A.D. 305-06), commonly known as *Chlorus*. He was adopted as Cæsar in 292 by Maximian, and received the government of Gaul. When Diocletian and Maximian abdicated the throne, May 1, 305, Constantius and Galerius became emperors respectively of the West and the East. Constantius died at Eboracum (York), in Britain, July, 306, and was succeeded by his son, Constantine the Great. He was distinguished alike for his intrepidity as a soldier and for his ability and humanity as a ruler.

CONSTANTIUS II., FLAVIUS JULIUS. A Roman Emperor (A.D. 337-61). By Fausta, the second son of Constantine the Great, he was born at Sirmium (Illyricum), A.D. 317. Constantine made him Cæsar in 323, and in 335 appointed him ruler in the East, where, after 337,

he reigned as Emperor. Often involved with the Persians, he suffered at their hands a galling defeat in 348. His brother Constans being murdered by Magnentius, he met the latter in battle at Mursa, and punished him so grievously that he subsequently perished by his own hand. Constantius now reigned alone over the whole Empire. He made his cousin, the apostate Julian, Cæsar in Gaul, and bestowed upon him the hand of his sister, Helena. When, however, Julian achieved great glory, he became jealous, and demanded the relinquishment of many troops. With this order Julian was disposed to comply, but his admiring soldiers refused to leave him. Constantius then proceeded against him, but died of fever before an engagement, whereupon Julian, previously proclaimed, succeeded to the title. As a ruler Constantius was severe and oppressive.

CONSTANTS OF NATURE. A term applied to various unchangeable quantities that are found to be characteristic of natural phenomena or relations. The propagation of light through space takes place invariably at the rate of 186,770 miles per second, and hence the velocity of light may be referred to as a constant of nature. The period of rotation of the earth on its axis may be considered as another constant of nature, although, strictly speaking, it is subject to slight variation. The atomic weights of chemistry—i.e. the smallest relative combining weights of the elements—furnish another example of important constants of nature—important because they permit of expressing the composition and reactions of all substances in a simple and useful form. The electrolytic equivalents—i.e. the weights of elements deposited in the electrolysis of their compounds by a unit current in one second—are likewise constants characteristic of the several chemical elements.

In choosing the units of precise measurement, which form the basis of all calculations in pure and applied science, it is necessary to employ the constant quantities of nature. For example, the second, which is the unit of time generally used at present, is defined in terms of the time of a complete revolution of the earth on its axis. As thus defined, however, the unit is not quite perfect; the time of a revolution of the earth on its axis is subject to slow variation, and hence the duration of the second, referred to that time, must likewise be slowly changing. With a view to establishing a more perfect unit of time, scientists have proposed to adopt as its basal constant of nature the period of vibration of an atom emitting light of a given wave-length—an interval of time that is believed to be absolutely constant.

The laws of science are generally expressed in the form of mathematical equations whose numbers and terms represent the constant as well as the variable factors of typical natural phenomena. Thus, the variation of volume under variable conditions of temperature and pressure, which is characteristic of all bodies, is in the case of perfect gases subject to laws that are usually expressed by the equation $PV = RT$, in which P stands for pressure, V for volume, and T for the absolute temperature. If, in experimenting with different gases, we should employ such quantities of them as would, under the same conditions of pressure and temperature,

occupy equal volumes, we would find that while the pressure and temperature might subsequently be changed, the factor R would remain constant and the same for all gases, irrespective of their chemical nature: that is to say, the product of the pressure and volume (PV), divided by the absolute temperature (T), would yield invariably the same number. That number (R), called 'the gas constant,' is therefore obviously characteristic of the interdependence of pressure, volume, and temperature, in all gaseous matter; and being so general, it has great importance in both pure and applied science. Thus, the constants of nature characterize natural phenomena and enter into all the mathematical laws of science.

Consult: Lupton, Everett, *C. G. S. System of Units* (London, 1891); Landolt and Börnstein, *Physikalisch-chemische Tabellen* (Berlin, 1893); Clarke, *The Constants of Nature* (5 parts, Smithsonian Miscellaneous Collections, Washington, 1873-88). Some of the constants of nature may of course be found in any scientific text-book. See also CALCULUS; C. G. S. SYSTEM.

CONSTANZA, *Sp. pron.* kón-stán'thá. A character in Middleton's *Spanish Gipsy*, who disguises herself as a gipsy called Preciosa and accompanies her father into exile.

CONSTELLATION (Lat. *constellatio*, from *com-*, together + *stella*, star, Gk. ἀστὴρ, *astēr*, Skt. *star*, Ar. *star*, OHG. *sterno*, *sterno*, Ger. *Stern*, AS., Engl. *star*). A group of stars. From a time earlier than authentic records can trace, the stars have been formed into artificial groups, which have received names borrowed from fancy or fable. These groups are called constellations. Though quite devoid of anything like systematic arrangement, this traditional grouping is found a sufficiently convenient classification, and still remains the basis of nomenclature for the stars among astronomers. Before the invention of almanacs, the risings and settings of the constellations were looked to by husbandmen, shepherds, and sea-faring men as the great landmarks of the seasons, and consequently of the weather which each season was expected to bring with it (see Job xxxviii. 31); and it is not surprising if the storms or calm weather that usually accompanied such seasons were connected, in the popular imagination, with the influence of the stars themselves, or the beings with whom superstition or fable identified them. Thus, the risings and settings of Boötes with the bright star Arcturus, which took place near the equinoxes, portended great tempests. (See Vergil's *Georgics*, i. 204.) The great heat in July was ascribed to the rising of Canis, the dog, with its bright star Sirius. (See CANICULA; HELIACAL RISING.) The appearance of the twins, Castor and Pollux, was hailed as the harbinger of fair summer weather.

Almost all nations have, from early times, arranged the stars into constellations, but it is chiefly from the nomenclature of the Greeks and Romans that our own is derived. Eudoxus, a contemporary of Plato, about 370 years B.C., gave a description of the face of the heavens, containing the names and characters of all the constellations recognized in his time. Though this production is lost, a poetical paraphrase of it, written about a century later by Aratus (q.v.), is still extant. This poem describes twelve zodiacal constellations (see ZODIAC), with twenty

in the Northern Hemisphere and thirteen in the Southern. The next enumeration occurs in the *Almagest* of Ptolemy, which includes the preceding, with three additional, one northern and two southern constellations, making in all 48. These are the ancient stellar groups. Large accessions have been made to the nomenclature in modern times, in consequence of maritime discovery having made us acquainted with constellations in the Southern Hemisphere which never rose upon the world known to our ancient authors. In 1751 Lacaille went to the Cape of Good Hope for the purpose of making a catalogue of the southern stars, and forming them into constellations—an undertaking which he prosecuted with great ardor for nearly four years, at the expense of the French Government. Even the flattery of courtiers has contributed toward the stellar nomenclature. Upon the restoration of Charles II., the evening before his return to London, Sir Charles Scarborough, the Court physician, was gazing upon a star in the northern heavens which shone with greater luminosity than usual, as might be expected from a loyal star on such an occasion. This, in connection with a few others, was formed into *Cor Caroli*, the heart of Charles II., by Halley, at the doctor's recommendation. The chief constellations will be noticed under their several names. (See ARIES; URSA MAJOR, etc.) The fanciful figures from which the constellations are named are depicted on celestial globes and maps of the heavens.

In the older writers upon astrology, constellation signifies the relative positions of the planets at a given moment. See ASPECT.

CONSTELLATION. A famous United States vessel, built in 1798, which, as the flagship of Commodore Truxton, captured the French frigate *Insurgente* in 1799, and in 1800 won a brilliant victory over the superior French frigate *La Vengeance*.

CONSTIPATION (Lat. *constipatio*, from *constipare*, to crowd together, from *com-*, together + *stipare*, to crowd, from *stipes*, stem). Abnormal retention in the intestines of fecal matter, or its passage in abnormally hard masses. Normally the bowels of an infant should 'move' or be emptied from two to five times in 24 hours; the bowels of an adult once in 24 hours. The causes of constipation are imperfect digestion (due to deficient secretion in the alimentary canal, inaction of the liver, or insufficient contraction of the muscular fibres of the intestine), insufficient exercise, the use of alcohol or drugs, or improper food. The treatment of constipation may be dietetic, hygienic, and medicinal. The diet should be largely vegetable, with whole-wheat bread, cereals, fruit, and an increase of fats and water, with little meat, no alcoholic beverages, and little sugar. A daily cold sponge-bath, regular out-of-door exercise, and circular massage of the abdomen in the direction of the passage of the intestinal contents, relieve many cases. In other cases an enema of soap and water or cathartic medicines may be necessary. See CATHARTIC.

LOWER ANIMALS. Constipation in the lower animals depends, as in man, on imperfect secretion from, or motion of, the intestinal walls. In the horse it is usually accompanied by colic (q.v.), and when long continued leads to enteritis (q.v.). The appropriate remedies are soap

and water clysters, given every two hours; smart friction and cloths wrung out of hot water applied to the abdomen, with three drachms of aloes and one of calomel, given in gruel, and repeated in sixteen hours if no effect is produced. Give, besides, walking exercise; restrict the amount of dry solid food, but allow plenty of thin gruel or other fluids, which may be rendered more laxative by admixture with treacle or a little salt. Similar treatment is called for in dogs, cats, and pigs. In cattle and sheep digestion principally takes place in the large and quadrisected stomach; the bowels, accordingly, are little liable to derangement; and constipation, when occurring in these animals, generally depends upon impaction of dry hard food between the leaves of the manyplies, third stomach, or fardel-bag. The complaint is hence called *fardel-bound*. It results from the eating of tough and indigestible food, such as ripe vetches, rye-grass, or clover; it prevails in dry seasons, and on pastures where the herbage is coarse and the water scarce. It occurs among cattle partaking freely of hedge-cuttings or shoots of trees, hence its synonym of *wood-civil*. From continuous cramming and want of exercise, it is frequent in stall-feeding animals, while from the drying up of the natural secretions it accompanies most febrile and inflammatory diseases. The milder cases constitute the ordinary form of indigestion in ruminants, are accompanied by what the cowman terms *loss of cud*, and usually yield to a dose of salts given with an ounce or two of ginger. In more protracted cases rumination is suspended, appetite is gone, constipation and fever are present. There is a grunt noticeable, especially when the animal is moved, and different from that accompanying chest-complaints, by its occurrence at the commencement of expiration. By pressing the closed fist upward and forward beneath the short ribs on the right side, the round, hard, distended stomach may be felt. This state of matters may continue for ten days or a fortnight, when the animal, if unrelieved, becomes nauseated, and sinks. Stupor sometimes precedes death, while in some seasons and localities most of the bad cases are accompanied by excitement and frenzy. In this, as in other respects, the disease closely corresponds with stomach-staggers in the horse. *Treatment*.—Give purgatives in large doses, combining several together, and exhibiting them with stimulants in plenty of fluid. For a medium-sized ox or cow, use three-quarters of a pound each of common and Epsom salts, ten croton beans, and a drachm of calomel, with three ounces of turpentine, and administer this in half a gallon of water. If no effect is produced in twenty hours, repeat the dose. Withhold all solid food; encourage the animal to drink gruel, soft bran mash, molasses and water; and give exercise, enemata, and occasional hot fomentations to the belly.

CONSTITUENT ASSEMBLY. See ASSEMBLY, NATIONAL.

CONSTITUTION (Lat. *constitutio*, a settlement of a controversy; then a decree: from *constituere*, to cause to stand, to establish, from *con-* + *statuere*, to erect, to establish). Formerly used of any law promulgated by sovereign authority. In the Roman Empire, the imperial legislation, decreed and put into effect by the will of the Emperor, was comprehensively described by the term *constitutiones*. These included *re-*

scripts, or answers to questions or petitions; *mandates*, or instructions to officials, administrative and judicial; *decrees*, or judgments on causes brought before him, directly or on appeal; and *edicts*, or general proclamations. See CIVIL LAW.

So in early English law, *constitution* signified any statute, though it was not commonly employed except with reference to certain important legislation affecting the relations of the State and the Church. Thus, the Constitutions of Clarendon were laws enacted in the reign of Henry II. at a Parliament held at Clarendon in 1164, restricting the power of the clergy, limiting the right of appeal to the Pope, and virtually making the King the supreme head of the Church in England.

At the present time, however, the term is used in the more restricted sense of the fundamental law of a State, society, or corporation, public or private. More specifically, the Constitution of a State or society is the body of legal rules by virtue of which it is organized and governed, and which determines its legal relations to other States and societies and to its own members. This Constitution may be created by the political or other body whose powers it defines and regulates, or by the individuals composing it and from whom its powers are derived, or it may be the creation of an external authority to which it is subject. Examples of the last form of constitution are afforded by the case of the ordinary private corporation, whose fundamental law is prescribed by the State to which it owes its existence; by municipal corporations, such as cities and villages, which derive their authority from their charters of incorporation and from the municipal law of the State to which they belong; and by subject States, territories, or colonies, whose constitutions are to be looked for in the legislation of the parent or sovereign State. The constitutions of Canada, of Hawaii, of Porto Rico, and to a certain extent that of the Republic of Cuba, belong to this class—the act of the American Congress, under the authority and the limitations of which the Cuban Constitution was recently enacted, being in effect a part thereof.

Examples of the second form of fundamental law exist, in the political sphere, in popular constitutions like those of the United States, of the several States of the American Union, of the French Republic, and of Switzerland; and, in the domain of private law, by the rules adopted by the stockholders of corporations and voluntary associations for the conduct of their affairs by their boards of directors and other officers.

The first type of constitution, in which the fundamental law is the creation of the powers yielding the sovereign authority of the State, is to be found in all of the monarchical States of Europe which have adopted, in whole or in part, a constitutional form of government. The free Constitution of England, so popular in character and so largely the product of custom, in a strict legal sense, belongs in this category as clearly as does the government of the Czar, the autocratic character of which has been modified by imperial concessions. To this class also we must refer the Constitution of the Roman Empire, as well as of the Republic, and of the free commonwealths of ancient Greece. It is to this form of constitution, because it is alterable by the ordinary legislative authority of the State, that Mr. Bryce ap-

plies the term 'flexible,' while constitutions of the second and third classes, which are superior to the ordinary law-making power and not capable of amendment except by the higher authority which created them, he describes as 'rigid' constitutions.

It is obvious that the authority of a self-imposed constitution differs widely from that of a true fundamental law, which underlies the ordinary processes of government and by which a political society has chosen to limit or has been constrained to restrict its governmental agencies. In a legal sense, therefore, the real distinction between constitutions does not turn upon the ease or difficulty with which they can be altered, nor yet upon the fact that the established process for amending a constitutional provision differs from the ordinary processes of legislation, but in the fact that a constitution of the one type is a part of the ordinary law of the land, and that a constitution of the other type is superior to the ordinary law; that in the one case legislation is irresponsible and uncontrollable, while in the other it is controlled by the fundamental law. In a State having a constitution of the one sort we shall expect to find a court or other independent representative of the sovereign power from which the Constitution was derived, which shall protect it from encroachments on the part of the ordinary law-making power; in a State of the other sort, we shall look to see the governing authority of the State unfettered by any external authority—itsself the supreme representative of the sovereignty of the State.

Ordinary Constitutions.—The Constitution of Great Britain affords the best modern example of the nature and operation of an *ordinary* constitution; that of the United States, the best example of an *extraordinary*, or *supreme*, constitution. The British Constitution is an indefinite body of legal rules and principles, partly customary, partly the result of judicial decisions, and partly made up of acts of Parliament. These are nowhere collected in one place, but must be extracted from the whole body of the common and statute law of the realm and from observation of the workings of the Government. Any act of Parliament and any judicial decision may modify it, and not infrequently statutes have been passed which have contained both constitutional and ordinary legislation mingled together in one and the same paragraph. Not only is there no authoritative statement of the British Constitution to be found, but, from its very nature, no such statement could be made. So much of it depends upon custom and so much is left to time and circumstance, that the most precise definition of its terms would be the most misleading. No law, statutory or judicial, has created the Cabinet, to which, as the executive committee of the House of Commons, the government of the Empire is at present committed; but whether it is really the Cabinet, or a committee of the Cabinet, or the Prime Minister, that governs England, is so much a question of personality and of circumstances that it defies answer. So no one can say whether the Crown still retains the ancient prerogative of vetoing an act of Parliament. It is commonly assumed that the power is extinct. The only safe statement that could be made, however, would be that the right has not been exercised for nearly two hundred years, and that only a grave emergency would justify the

sovereign in employing it; and if this should occur, there is no lawful process by which the act, however repugnant to current ideas of government in England, could be declared unconstitutional or deprived of its legal effect. Under such a system the Constitution would sanction any governmental act which could be performed without precipitating a revolution.

The latest English writers distinguish between the *law* and the *custom* of the Constitution, the former having reference to certain statutory provisions—such as the act settling the succession to the crown, the bill of rights, etc.—which, being laws in the strictest sense of the term and tending to limit the authority of a single branch of the Government and not the supremacy of Parliament, are capable of enforcement by the courts; and the latter, to the great body of customary rules and observances which in practice control the working of the Government and the distribution of its powers, but are enforced only by public opinion and by respect for the settled order of the Constitution. The latter are not true laws, as they lack the sanction of any but legal authority to declare and enforce them. In the field of ordinary jurisprudence no such distinction as this can be drawn between custom and law. There custom is law, and will be enforced as such. But the case is manifestly different in the sphere of constitutional law, for there a custom tending to restrict the action of the sovereign power can find no jurisdiction to enforce it.

A constitution of the ordinary legal type may belong to either of the two old categories of 'written' and 'unwritten' constitutions—an unwritten constitution being one which is wholly or largely based on custom or judicial decisions, and a written constitution being the result of a specific act of legislation and having the definite form and the certainty of a body of statute law. But the distinction, though sound enough, is of no practical importance, as no considerations of political philosophy or of legal validity are involved in it. In fact, every political constitution is a composite of common and statute law, of custom and of legislation, and the validity of its several provisions is not in the least dependent upon the manner in which the principles which they embody have acquired the form and content of legal authority. The British Constitution, for example, is much more than a body of customary law. At least five important sources of the rules and principles which it embodies may be distinguished. These are: (1) Two principal treaties, the Act of Union with Scotland in 1707 and the Act of Union with Ireland in 1800. (2) Certain great 'compact,' viz. Magna Charta, in 1215, the Declaration of Right, in 1689, and the Act of Settlement, in 1701. (3) A large number of public acts of Parliament, ranging from matters of the greatest to those of the least political importance. (4) The body of precedents and customs known as the common law. (5) The usages and practices known specifically as the customs of the Constitution, which are in reality the mass of practical expedients and understandings by which government is mainly carried on. To these last we have denied the character of law, partly because of their indefiniteness and fluctuation, but more particularly because of their lack of a legal sanction. The fourth class consists of legal rules in the proper sense of the term, but of the sort contemplated by the use of the word unwritten;

but nevertheless, if formal treaties and acts of Parliament are written law, then is the British Constitution, in part at least, a written constitution. Some constitutions of the ordinary type, however, are of the strictly 'written' sort, being the result of a single legislative act or a grant of power from the sovereign head of the State. Most of the constitutions which have been promulgated in the several States of Continental Europe, as well as that of Japan, are of this character. They have the common characteristic of the lack of any superior sanction. A law enacted by the ordinary legislative authority and promulgated by the supreme executive power of the State is a law, whether sanctioned by the Constitution or not. In other words, a law may be unconstitutional and yet valid.

Extraordinary Constitutions.—As the polity of the British Empire furnishes the best example of the ordinary, 'flexible,' and unwritten constitution, so does the fundamental law of the United States exhibit the best and most characteristic constitution of the opposite type—of the extraordinary, or supreme, and 'rigid' form. Though the constitutions of the General Government and of the several States have very great and even fundamental differences, they are all alike in this respect, that the organic law has a sanction superior to that of the ordinary law of the land; that the Constitution is in fact 'the supreme law' to which the ordinary law must conform; that the sovereignty is not wholly committed to the ordinary agencies of government, but the power of these is limited, and that this limitation on legislative and executive action is not a mere form of words, but is rendered effective by the power vested in the courts of annulling acts of the State in contravention of the supreme law. The Federal Government and the governments of the States are, therefore, not sovereign, but legally limited corporations, strictly analogous to private and minor municipal corporations, which derive a limited authority from the State which created them. There is nothing singular in the power exercised by the courts in declaring a corporate act invalid because of its transcending the legal authority of the body performing it, even in the political sphere. It is plain that the political action of a colony, even of the 'self-governing' type, and of dependent States, as well as of cities and towns, is subject to control by the dominant political authority. The British Parliament and the English courts exercised this authority over the American colonies as they now exercise it over Canada and Australia. The novelty of the American system consists in the application of this familiar principle to independent and sovereign States. The right of the Supreme Court of the United States, and even of the ordinary Federal tribunals, to pass upon the validity of acts of the National Congress was long disputed, but it was asserted by the Supreme Court as early as 1797, and actually exercised in the celebrated case of *Marbury vs. Madison* in 1803. This conclusion was so plainly sound, and so obviously necessary to the working of the American constitutional scheme, that it has been generally acquiesced in. Several of the State courts had in the meantime reached a similar decision as to their authority to nullify acts of their own legislatures when in conflict with the local Constitution or with that of the United States, and the prin-

ciple may now be regarded as an essential part of the constitutional system of the United States. See SUPREME COURT OF THE UNITED STATES.

There is one important difference between the fundamental law of the United States and that of the several States. The National Government being a federal union of independent commonwealths—some of them existing before its formation and others having come into the Union as independent States—the National Constitution is simply a grant of powers from the latter to the former, while the State constitutions are merely limitations upon the power of the ordinary agencies of government of the States. From this it follows that the Federal Government has no powers excepting such as are conferred by the Constitution to which it owes its existence, while the State governments, on the contrary, have vested in them the full sovereignty of the commonwealth, excepting as this is limited by the local Constitution and that of the United States. The function of the courts of the United States and of the several States in interpreting their respective constitutions is very different therefore. An act of Congress is invalid if it transcends the powers conferred upon the legislative branch of the Government by the fundamental law; whereas, an act of the Legislature can be impeached for unconstitutionality only if it is in contravention of one of the limits placed by the Constitution on legislative power.

In general, constitutions may be amended, altered, or abrogated by the same power which created them, or by a process provided in the fundamental law for that purpose. A constitution which is the free gift of the sovereign authority may be recalled or nullified by the authority that conferred it. A rigid constitution of the American type, which is the creation of the people, and which cannot be directly changed without their concurrence, has in practice been found to be of the most inflexible kind. For a period of more than sixty years after the adoption in 1803 of the Twelfth Amendment (relative to the election of President and Vice-President) the Constitution of the United States did not suffer a single amendment, and the three amendments adopted at the close of the Civil War, and as the result thereof, have been the only changes which it has since sustained. Like the English Constitution, however, it has changed greatly, though imperceptibly, by the insidious processes of custom and of judicial interpretation. The history and language of the instrument, and the nature of the changes which it has undergone, will be set forth in the article on the CONSTITUTION OF THE UNITED STATES. See also GOVERNMENT; STATE; SOVEREIGNTY; GREAT BRITAIN; and the titles of other States concerning whose constitutions information is sought.

Consult: Bryce, *The American Commonwealth* (2d ed., London and New York) and *Studies in History and Jurisprudence* (London and New York, 1901); Burgess, *Political Science and Comparative Constitutional Law* (Boston, 1900); Anson, *Law and Custom of the Constitution*, part i. (7th ed., Oxford, 1893), part ii. (2d ed., 1896); Dicey, *Lectures Introductory to the Study of the Law of the English Constitution* (4th ed., London, 1893); Bagehot, *The English Constitution* (new ed., London, 1896); Von Holst, *Constitutional and Political History of the United States* (Leipzig: Am. ed., Chicago);

Cooley, *Treatise on the Constitutional Limitations which rest upon the Legislative Power of the States* (Boston, any edition). Consult also the historical works referred to under the various titles UNITED STATES; GREAT BRITAIN, etc.

CONSTITUTION, THE. A forty-four-gun frigate, the most famous vessel in the history of the United States Navy, sometimes called 'Old Ironsides,' from the hardness of her planking and timbers. She was launched on October 21, 1797, but was not completed and equipped until the following year, when she put to sea under Captain Nicholson for service against the French. During the war with Tripoli, 1801-05 (see *BARBARY POWERS, WARS WITH*), she was Preble's flagship, and in 1805 took part in three of the five bombardments of the port of Tripoli. In July, 1812, in command of Isaac Hull (q.v.), she escaped from a British squadron off the New Jersey coast, after a spirited chase of three days, and on August 19, off Cape Race, fought her famous battle with the *Guerrrière*, Captain Daeres, a somewhat weaker English frigate, which she left a total wreck after an engagement of thirty minutes, the English losing 79 of their crew, the Americans 14. On December 29, under the command of Captain Bainbridge, she captured off Bahia, Brazil, the *Java* (38 guns, Captain Lambert), after a two hours' engagement, in which the British lost 300 in killed and wounded, the Americans 34. On February 14, 1814, under Captain Stewart, she captured the *Piéton*, 16 guns, and a convoy, in the West Indies; and on February 20, 1815, she took the *Cyane*, 34 guns, and the *Levant*, 18 guns, after a fierce engagement—remarkable for the seamanship of the Americans and the gallantry of the English—between the Madeira Islands and Gibraltar. The English lost 19 killed and 42 wounded out of 320; the Americans, 6 killed and 9 wounded out of 451. Soon afterwards the *Constitution* was closely pursued by a strong British squadron, which recaptured the *Levant*. Reported unseaworthy between 1828 and 1830, she was ordered to be dismantled, but was retained in deference to the popular sentiment aroused by Holmes's poem "Old Ironsides," and in 1833 was rebuilt. She went out of commission in 1855 at Portsmouth, N. H., was subsequently used occasionally as a training ship, was again partially rebuilt in 1877, crossed the Atlantic for the last time in 1878, and was stored at the Boston Navy Yard in 1897. Consult: Hollis, *The Frigate Constitution* (Boston, 1900); and Roosevelt, *The Naval War of 1812* (New York, 1882).

CONSTITUTION, CHEMICAL. See *CHEMISTRY; CARBON COMPOUNDS; STEREOCHEMISTRY.*

CONSTITUTIONAL LAW. In general, that branch of public law which deals with the nature and organization of government, the distribution and mode of exercising the sovereign powers of the State, and the relations of the Government to those who are subject to its authority. It has nothing to do with the regulation of the external relations of a State with other States, these being governed by international law, though the agencies for maintaining those relations, and the determination of their character and form, may be included within the constitutional law of the State. Thus, the choice of ambassadors, as well as their rank and functions, being the direct

concern of the State they are chosen to represent, is governed by its constitutional law, and so, in the United States, is the power exercised by the Senate in approving, amending, or rejecting treaties with foreign powers.

Again, where the States are not related to one another as independent political communities, but sustain a relation of superior and dependent States, as of a colony to the parent State, or a subject to a dominant State, or of a member of a federation of States to the central authority, such relations are matters not of international, but of constitutional law. Thus, the Acts of Union of England with Scotland and Ireland, the acts of the British Parliament incorporating the Dominion of Canada and the Commonwealth of Australia, the various acts of Congress providing for the government of Porto Rico, Hawaii, and the several Territories of the United States, the provisions of the American Constitution determining the relations between the General Government and the individual States—all these are as much a part of the constitutional law of the States affected by them as are their Bills of Rights, or the laws and customs determining the powers of their respective legislatures.

On the other hand, two political communities may be for some purposes constitutionally related and may yet in some respects remain foreign to one another. Thus, while the relations of the several States of the American Commonwealth to the central authority, and, through that authority to one another, are governed by their constitutional law, they are yet for many purposes independent of one another, and, in so far as they are independent, their relations are matters of international and not of constitutional law.

Specifically, the constitutional law of a State consists of its Constitution, or so much of it as is legally effective, together with the constructions and interpretations which it has received at the hands of the courts or other competent authority.

BRITISH CONSTITUTIONAL LAW. Under a flexible constitution like that of England, which is mainly the result of the accumulated experience of ages, the principal function of constitutional law is to discriminate between those portions of the Constitution which are law, in the strict sense of the term, i.e. which have a legal sanction and will be declared by the courts, and those that rest only upon the customs of the community and upon considerations of practical expediency. These last, which are known as the 'custom of the Constitution,' may have a moral sanction which makes them for the time being as effective politically as the law of the Constitution. But, being legally ineffective, i.e. unenforceable by the authority of the State, they do not, strictly speaking, belong in the category of constitutional law. As a considerable part of the British Constitution is made up of such customs and practical expedients, the range of law comprised within it is comparatively narrow. It is to be remembered, however, that though custom, in and by itself considered, is not a part of constitutional law, it may become a source of such law by being adopted by the courts and declared in judicial decisions. More than one of the so-called liberties of the subject in England have thus arisen and now form part of the common law of the land. It is to be observed, also, that in Great Britain constitutional law does not exist as a

separate and distinct body of rules and precedents, its provisions being an integral part of the common and statute law of the realm, from which they are to be collected.

AMERICAN CONSTITUTIONAL LAW. In a State which has a constitution of the 'fixed' or statutory type, like the United States, much less is left to convention and understanding, and much less depends upon custom and expediency. The area of law under such a constitution is, therefore, much wider, while the task of the constitutional lawyer is much simpler. The constitutional law of such a State consists of the terms of the Constitution itself, with the amendments thereto, and the judicial decisions in which its provisions have come up for construction and application. No acts of the legislature declaring the rights of the citizen, no treaty with a foreign government, no abdication of power by any arm of the State, enters into it. In the American system the only authoritative exposition of a constitution is that afforded by the courts. This extraordinary jurisdiction is not confined to the Supreme Court, but is exercised as well by the inferior Federal courts and by the regular tribunals of the several States. As constitutional law, the judgments of these courts vary according to the Constitution whose provisions are under examination. The Supreme Court of the United States is the final authority on the Federal Constitution, and the supreme appellate courts of the several States on the constitutions of their respective States.

It will be borne in mind that the judicial power in the United States extends to acts of Congress and of the legislatures, the Constitution being the supreme law to which all legislation must conform; whereas, the British Constitution, not being a supreme law, but a part of the ordinary law of the land, the powers of Parliament are not and cannot be limited by it. Accordingly judicial decisions upon the legislative power and its limitations, which constitute the bulk of constitutional law in the United States, are wholly unknown in England.

This, indeed, is the leading principle of American constitutional law—that all acts of government, whether legislative, judicial, or administrative, made or done in contravention of the Constitution, are void. This principle is equally applicable to the constitutions of the several States and to that of the United States. But the Federal Government being one of strictly limited powers, a still more stringent principle is applied to test the validity of its acts—namely, that they are void if not specially sanctioned by the fundamental law. But it does not lie within the competence of the courts to control the action of the State on any other principles than such as are laid down in the fundamental law. They cannot declare void an act within the general competence of the legislative powers, merely because it is contrary to natural justice, or because it violates fundamental principles of republican government, or because of a supposed conflict with the general spirit of the Constitution. It should be added that an act adjudged to be unconstitutional is held to have been void and without legal validity from the time of its enactment.

In the article **CONSTITUTION** (q.v.), reference is made to certain changes which the Constitution of the United States has undergone as the result

of judicial interpretation and the slow growth of custom. The former of these is clearly a part of constitutional law, but it is not easy to say how far a particular custom, if threatened with violation, would be supported by the courts. It seems probable, however, that the Supreme Court would not hesitate to recognize a well-established practice of the Government as a part of the constitutional law of the land. If, for example, a Presidential elector should at the present time assert his right to disregard the instructions under which he was chosen and cast his vote for the candidate of the opposing party, there is at least a question whether he could not be restrained by the courts from carrying his intention into effect. See **CONSTITUTION OF THE UNITED STATES; LAW; PUBLIC LAW.** Besides the authorities referred to under the title **CONSTITUTION**, consult: Boutmy, *The English Constitution* (London and New York, 1891); and Story, *Commentaries on the Constitution of the United States* (5th ed., Boston, 1891).

CONSTITUTIONAL UNION PARTY. A party, formed chiefly out of the remnants of the Know-Nothing and Whig parties, which met in convention at Baltimore in May, 1860, and nominated John Bell (q.v.) and Edward Everett (q.v.), for President and Vice-President, respectively, on a platform which declared simply for "the Constitution of the country, the union of the States, and the enforcement of the laws." The party carried Virginia, Kentucky, and Tennessee, and east a popular vote of about 600,000, and an electoral vote of 39, in the ensuing election. After this campaign the party virtually went out of existence. It was also known as the 'Bell-Everett party.'

CONSTITUTION OF MATTER. See **MATTER, PROPERTIES OF.**

CONSTITUTION OF THE UNITED STATES. The Federal Constitution of the United States of America is one of the class of 'written' and 'rigid' constitutions, and the most important example of a constitution of the 'supreme' or 'extraordinary' type. That is to say, it is not only the result of a definite purpose and of a deliberate act of legislation, embodied in written form: it is not only incapable of modification by ordinary legislative processes; but it is the true supreme law of the land, to which all other law must conform, and conformity to it is the test of the validity of the ordinary law. The commanding quality of the Federal Constitution is the fact that it is not, like most political constitutions, including those of the several States of the American Union, a mere restriction upon the authority of the governing powers of the State, but that it creates a new frame of government, which it endows with certain limited powers, and from which it deliberately withholds all powers not so granted. The government so constituted by it is, therefore, a government of granted, and not of antecedent authority, and the Constitution is not only the supreme law of the land, but comprehends within itself the whole of that law.

There is some confusion, therefore, in the use of such phrases as the 'territorial extent,' 'the Constitution follows the flag,' and whether the Constitution 'applies' to certain newly acquired Territories. Strictly speaking, the Constitution has no territorial extension; it neither expands

nor contracts with the limits of American jurisdiction; but, whatever those limits may be, it steadily and invariably binds the governmental agencies of the nation and limits their authority. In so far as it confers general powers of government on the President and Congress, those powers may be exercised in the ends of the earth as well as within the limits of the original States; whereas, the restrictions upon that power are equally valid, wherever it may be exercised.

This view of the Federal Constitution, as a carefully guarded grant of powers to the Central Government, explains even those guarantees of personal liberty and security which it contains and which are commonly referred to as the Bill of Rights of the Constitution (Amendments I-X.). These are not, as they are commonly understood, an unlimited charter of liberties for the people of the United States, but only restrictions upon the exercise of arbitrary power by the President and Congress. They are not aimed at the States or at local authority. It is announced as "a settled rule of construction of the national Constitution, that the limitations it imposes upon the powers of government are in all cases to be understood as limitations upon the government of the Union only, except where the States are expressly mentioned" (Cooley, *Constitutional Limitations*, p. 19). Accordingly, even such a right as that of trial by jury in criminal cases, which is usually regarded as one of the inalienable rights of the American citizen, is by the Federal Constitution protected only against violation by Congress and the Federal judiciary. Excepting as they are restrained by their own constitutions, there is nothing to prevent the several States from abolishing the jury system entirely.

From what has been said above it will be observed that the Constitution of the United States is not, as it is conceived by foreigners, a complete scheme of government for the people of the United States, but only a part, and that the smaller part, of such a scheme. To fill out the outline, the constitutions and laws of the several States must be taken into account. These provide by far the greater part of the machinery of government, the securities of life, liberty, and property, and the political rights of the citizen.

The Constitution of the United States, in the form in which it is reprinted in this article, represents a long process of experiment and discussion, in the course of which the jealousies and conflicting interests of the different States and sections of which the Union was made up, were gradually compromised and subordinated to the common welfare of all. The Articles of Confederation, by which the ill-jointed union of the thirteen original States was held together from 1779 to 1789, can scarcely be described as a constitution. In any proper sense of that term, as they created only the form and not the substance of government, and vested no real authority in the common representatives of the several commonwealths. They were more in the nature of a treaty of alliance, by which the States bound themselves to common action, and the Congress constituted by them an international conference for promoting the common welfare. The inconveniences and dangers of this arrangement speedily became too pressing to be ignored, and in February, 1787, Congress took such action as its limited powers permitted, and passed a resolution, suggesting that a convention of delegates from the several

States be held at Philadelphia on the second Monday of May following, "for the sole and express purpose of revising the Articles of Confederation, and reporting to Congress and the several State legislatures such alterations and provisions therein as shall, when agreed to by Congress and confirmed by the States, render the Federal Constitution adequate to the exigencies of government, and the preservation of the Union."

Pursuant to this resolution of Congress, delegates from twelve of the thirteen States (Rhode Island alone being unrepresented) assembled at Philadelphia, the convention opening its sessions in Independence Hall on May 14, 1787, under the Presidency of George Washington. For four months the delegates carried on the great work which had been intrusted to them, and at the close of their deliberations, on September 17, 1787, they had completed the Constitution of the United States, with the exception of the amendments, in the form in which we have it to-day. Their work was promptly approved by Congress, and at the close of the year 1788 had been adopted by eleven of the States and went into operation between them. The two remaining States, North Carolina and Rhode Island, ratified it and entered into the American Union in 1789 and 1790, respectively.

These results were not achieved without difficulty—in the face of profound differences of opinion. In most of the States the ratification of the Constitution was secured by narrow majorities, and after prolonged and earnest discussion, and in none of the States was it approved with anything approaching unanimity. This opposition and these differences of opinion were primarily due to what have been called 'the compromises of the Constitution.' These were three in number. The first dealt with the fundamental conflict between those who desired a strong central authority and those who feared the extension of executive power. This was compromised by investing the President of the Republic with great powers, but for a limited term only, and by a complicated system of 'checks and balances,' whereby the exercise of his power was at divers points and in various ways subjected to the control of Congress or of the Senate.

The second compromise was of the conflict of the great and small States, the former claiming the weight in the National Government to which their size, wealth, and population entitled them, and the latter insisting upon the recognition of their equality as independent, self-governing commonwealths. This was effected by the institution of two chambers of legislation, a Senate, in which the States were to have equal representation, and a House of Representatives, in which the representation should be in proportion to population. This compromise involved also the delicate question of the distribution of power between the two Houses of Congress.

The third compromise was of the controversy between the upholders of slavery and those who believed that slavery should be restricted or abolished. This was adjusted by the proviso forbidding Congress to prohibit the importation or migration of slaves before the year 1808 (Art. I., Sec. 9), and the requirement that fugitive slaves should be delivered up by the States in which they had taken refuge (Art. IV., Sec. 2). As no power was conferred upon Congress or the President to

interfere with slavery in the States in which it existed, the institution was left within the complete control of those States.

In some of the States, great dissatisfaction was expressed at the absence of anything like a Bill of Rights in the Constitution, and for a time the fear was felt that certain of the States might refuse to ratify unless the Constitution were amended. Accordingly, the first Congress after the adoption of the Constitution proposed a series of amendments, which were promptly ratified by the States as Articles I-X. of the amendments as they now stand. (See RIGHTS, BILL OF). Articles XI. and XII. speedily followed, in 1793 and 1803, respectively. From that date to the Civil War, no amendments to the original instrument were adopted. The three remaining amendments, Articles XIII., XIV., and XV., were adopted in 1865, 1868, and 1870, respectively, as a part of the reconstruction policy of the Government after the Civil War, in order to secure to the lately emancipated slaves the legal and political benefits of full citizenship in the United States and in the several States. The character and effect of these amendments are considered in the article on RIGHTS, CIVIL. See, also, CIVIL WAR; RECONSTRUCTION; SLAVERY.

It remains to be said, in conclusion, that, in speaking of the Constitution of a State, reference is made to the whole body of its fundamental law, whether embodied in written form or not. The Constitution of every active political community is the product of many agencies and influences, not merely of deliberate legislative action. That of the United States is no exception to this rule. The Constitution, as adopted in the early formative period of the Republic, and formally amended from time to time in the manner therein prescribed, has been more extensively amended by the insensible processes of use and custom, and by the far-reaching effects of judicial construction. As to the last, it may be said that the Constitution, in setting up a supreme judicial tribunal, with the function of passing upon the validity of national and State legislative action and of executive action, has indirectly provided for a process of amendment much more efficacious than that directly provided. The Constitution of the United States, as it exists to-day, therefore, must be looked for in the decisions of the courts and in the political practice of the people, as well as in the text of the original articles and their formal amendments. The leading authorities on the Constitution are: *The Federalist*; *Elliott's Debates in Convention on the Adoption of the Federal Constitution*; Curtis, *History, Origin, Formation, and Adoption of the Constitution of the United States*; Story, *Commentaries on the Constitution of the United States* (any edition); Cooley, *Treatise on the Constitutional Limitations Which Rest Upon the Legislative Powers of the States*; Von Holst, *Constitutional Law of the United States of America* (translation, Chicago, 1887); De Tocqueville, *Democracy in America* (translation, London, 1835); Bryce, *The American Commonwealth* (3d ed.), and the *Cases on Constitutional Law of the United States*, collected and edited by J. B. Thayer (Cambridge, Mass., 1894-95). See also, CONSTITUTION; CONSTITUTIONAL LAW; SUPREME COURT OF THE UNITED STATES. The text of the Constitution is as follows:

CONSTITUTION OF THE UNITED STATES.

We, the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquillity, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America.

ARTICLE I., Sec. 1. All legislative powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives.

Sec. 2. The House of Representatives shall be composed of members chosen every second year by the people of the several States, and the electors in each State shall have the qualifications requisite for electors of the most numerous branch of the State Legislature.

No person shall be a Representative who shall not have attained to the age of twenty-five years, and been seven years a citizen of the United States, and who shall not, when elected, be an inhabitant of that State in which he shall be chosen.

Representatives and direct taxes shall be apportioned among the several States which may be included within this Union according to their respective numbers, which shall be determined by adding to the whole number of free persons, including those bound to service for a term of years, and excluding Indians not taxed, three-fifths of all other persons. The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law direct. The number of Representatives shall not exceed one for every thirty thousand, but each State shall have at least one Representative: and until such enumeration shall be made, the State of New Hampshire shall be entitled to choose 3; Massachusetts, 8; Rhode Island and Providence Plantations, 1; Connecticut, 5; New York, 6; New Jersey, 4; Pennsylvania, 8; Delaware, 1; Maryland, 6; Virginia, 10; North Carolina, 5; South Carolina, 5; and Georgia, 3.

When vacancies happen in the representation from any State, the executive authority thereof shall issue writs of election to fill such vacancies.

The House of Representatives shall choose their Speaker and other officers; and shall have the sole power of impeachment.

Sec. 3. The Senate of the United States shall be composed of two Senators from each State, chosen by the legislature thereof, for six years; and each Senator shall have one vote.

Immediately after they shall be assembled in consequence of the first election, they shall be divided as equally as may be into three classes. The seats of the Senators of the first class shall be vacated at the expiration of the second year, of the second class at the expiration of the fourth year, and of the third class at the expiration of the sixth year, so that one-third may be chosen every second year; and if vacancies happen by resignation, or otherwise, during the recess of the legislature of any State, the Executive thereof may make temporary appointments until the next meeting of the legislature, which shall then fill such vacancies.

No person shall be a Senator who shall not have attained to the age of thirty years, and been nine years a citizen of the United States, and

who shall not, when elected, be an inhabitant of that State for which he shall be chosen.

The Vice-President of the United States shall also be president of the Senate, but shall have no vote, unless they be equally divided.

The Senate shall choose their other officers, and also a president *pro tempore*, in the absence of the Vice-President, or when he shall exercise the office of President of the United States.

The Senate shall have the sole power to try all impeachments; when sitting for that purpose, they shall be on oath or affirmation. When the President of the United States is tried, the Chief Justice shall preside; and no person shall be convicted without the concurrence of two-thirds of the members present.

Judgment in cases of impeachment shall not extend further than to removal from office, and disqualification to hold and enjoy any office of honor, trust, or profit under the United States; but the party convicted shall nevertheless be liable and subject to indictment, trial, judgment, and punishment, according to law.

Sec. 4. The times, places, and manner of holding elections for Senators and Representatives shall be prescribed in each State by the legislature thereof; but the Congress may at any time, by law, make or alter such regulations, except as to the places of choosing Senators.

The Congress shall assemble at least once in every year, and such meeting shall be on the first Monday in December, unless they shall, by law, appoint a different day.

Sec. 5. Each House shall be the judge of the elections, returns, and qualifications of its own members, and a majority of each shall constitute a quorum to do business; but a smaller number may adjourn from day to day, and may be authorized to compel the attendance of absent members, in such manner and under such penalties as each House may provide.

Each House may determine the rules of its proceedings, punish its members for disorderly behavior, and, with the concurrence of two-thirds, expel a member.

Each House shall keep a journal of its proceedings and from time to time publish the same, excepting such parts as may in their judgment require secrecy, and the yeas and nays of the members of either House on any question shall, at the desire of one-fifth of those present, be entered on the journal.

Neither House, during the sessions of Congress, shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two Houses shall be sitting.

Sec. 6. The Senators and Representatives shall receive a compensation for their services, to be ascertained by law, and paid out of the treasury of the United States. They shall in all cases, except treason, felony, and breach of the peace, be privileged from arrest during their attendance at the sessions of their respective Houses, and in going to and returning from the same; and for any speech or debate in either House they shall not be questioned in any other place.

No Senator or Representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United States, which shall have been created, or the emoluments whereof shall have been increased during such time; and no person holding any

office under the United States shall be a member of either House during his continuance in office.

Sec. 7. All bills for raising revenue shall originate in the House of Representatives; but the Senate may propose or concur with amendments, as on other bills.

Every bill which shall have passed the House of Representatives and the Senate shall, before it become a law, be presented to the President of the United States; if he approve, he shall sign it; but if not, he shall return it, with his objections, to that House in which it shall have originated, who shall enter the objections at large on their journal, and proceed to reconsider it. If after such reconsideration two-thirds of that House shall agree to pass the bill, it shall be sent, together with the objections to the other House, by which it shall likewise be reconsidered; and if approved by two-thirds of that House, it shall become a law. But in all such cases the votes of both Houses shall be determined by yeas and nays, and the names of the persons voting for and against the bill shall be entered on the journal of each House respectively. If any bill shall not be returned by the President within ten days (Sunday excepted) after it shall have been presented to him, the same shall be a law in like manner as if he had signed it, unless the Congress by their adjournment prevent its return; in which case it shall not be a law.

Every order, resolution, or vote to which the concurrence of the Senate and the House of Representatives may be necessary (except on a question of adjournment) shall be presented to the President of the United States; and before the same shall take effect, shall be approved by him, or, being disapproved by him, shall be repassed by two-thirds of the Senate and House of Representatives, according to the rules and limitations prescribed in the case of a bill.

Sec. 8. The Congress shall have power

To lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defense and general welfare of the United States; but all duties, imposts, and excise shall be uniform throughout the United States;

To borrow money on the credit of the United States;

To regulate commerce with foreign nations, and among the several States, and with the Indian tribes;

To establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies throughout the United States;

To coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures;

To provide for the punishment of counterfeiting the securities and current coin of the United States;

To establish post-offices and post-roads;

To promote the progress of science and useful arts, by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries;

To constitute tribunals inferior to the Supreme Court;

To define and punish piracies and felonies committed on the high seas, and offenses against the law of nations;

To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water;

To raise and support armies, but no appropriation of money to that use shall be for a longer term than two years;

To provide and maintain a navy:

To make rules for the government and regulation of the land and naval forces;

To provide for calling forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions;

To provide for organizing, arming, and disciplining the militia, and for governing such part of them as may be employed in the service of the United States, reserving to the States respectively the appointment of the officers, and the authority of training the militia according to the discipline prescribed by Congress;

To exercise exclusive legislation in all cases whatsoever over such district (not exceeding ten miles square) as may, by cession of particular States, and the acceptance of Congress, become the seat of the Government of the United States, and to exercise like authority over all places purchased by the consent of the legislature of the State in which the same shall be, for the erection of forts, magazines, arsenals, dock-yards, and other needful buildings; and

To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the Government of the United States, or in any department or officer thereof.

Sec. 9. The migration or importation of such persons as any of the States now existing shall think proper to admit shall not be prohibited by Congress prior to the year one thousand eight hundred and eight; but a tax or duty may be imposed on such importation, not exceeding ten dollars for each person.

The privilege of the writ of *habeas corpus* shall not be suspended, unless when in cases of rebellion or invasion the public safety may require it.

No bill of attainder or *ex post facto* law shall be passed.

No capitation or other direct tax shall be laid, unless in proportion to the census or enumeration hereinbefore directed to be taken.

No tax or duty shall be laid on articles exported from any State.

No preference shall be given by any regulation of commerce or revenue to the ports of one State over those of another; nor shall vessels bound to or from one State be obliged to enter, clear, or pay duties in another.

No money shall be drawn from the treasury but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

No title of nobility shall be granted by the United States; and no person holding any office of profit or trust under them shall, without the consent of the Congress, accept of any present, emolument, office, or title, of any kind whatever, from any king, prince, or foreign State.

Sec. 10. No State shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make anything but gold and silver coin a tender in payment of debts; pass any bill of attainder, *ex post facto* law, or law impairing the obligation of contracts, or grant any title of nobility.

No State shall, without the consent of the Congress, lay any imposts or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts, laid by any State on imports or exports, shall be for the use of the treasury of the United States; and all such laws shall be subject to the revision and control of the Congress.

No State shall, without the consent of Congress, lay any duty of tonnage, keep troops, or ships of war in time of peace, enter into any agreement or compact with another State, or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger as will not admit of delay.

ARTICLE II, Sec. 1. The executive power shall be vested in a President of the United States of America. He shall hold his office during the term of four years, and, together with the Vice-President, chosen for the same term, be elected as follows:

Each State shall appoint, in such manner as the legislature thereof may direct, a number of electors, equal to the whole number of Senators and Representatives to which the State may be entitled in the Congress; but no Senator or Representative, or persons holding an office of trust or profit under the United States, shall be appointed an elector.

The Congress may determine the time of choosing the electors, and the day on which they shall give their votes; which day shall be the same throughout the United States.

No person, except a natural-born citizen or a citizen of the United States at the time of the adoption of the Constitution, shall be eligible to the office of President; neither shall any person be eligible to that office who shall not have attained to the age of thirty-five years, and been fourteen years resident within the United States.

In case of the removal of the President from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the Vice-President, and the Congress may by law provide for the case of removal, death, resignation, or inability, both of the President and Vice-President, declaring what officer shall then act as President, and such officer shall act accordingly, until the disability be removed, or a President shall be elected.

The President shall, at stated times, receive for his services a compensation, which shall neither be increased nor diminished during the period for which he shall have been elected, and he shall not receive within that period any other emolument from the United States, or any of them.

Before he enters on the execution of his office, he shall take the following oath or affirmation: "I do solemnly swear (or affirm) that I will faithfully execute the office of President of the United States, and will, to the best of my ability, preserve, protect, and defend the Constitution of the United States."

Sec. 2. The President shall be commander-in-chief of the army and navy of the United States, and of the militia of the several States when called into the actual service of the United States; he may require the opinion, in writing, of the principal officer in each of the executive departments upon any subject relating to the duties of their respective offices, and he shall

have power to grant reprieves and pardons for offenses against the United States, except in cases of impeachment.

He shall have power, by and with the advice and consent of the Senate, to make treaties, provided two-thirds of the Senators present concur; and he shall nominate, and by and with the advice and consent of the Senate, shall appoint ambassadors, other public ministers and consuls, judges of the Supreme Court, and all other officers of the United States, whose appointments are not herein otherwise provided for, and which shall be established by law; but the Congress may by law vest the appointment of such inferior officers as they think proper in the President alone, in the courts of law, or in the heads of departments.

The President shall have power to fill up all vacancies that may happen during the recess of the Senate, by granting commissions which shall expire at the end of their next session.

Sec. 3. He shall from time to time give to the Congress information of the state of the Union, and recommend to their consideration such measures as he shall judge necessary and expedient; he may on extraordinary occasions convene both Houses, or either of them, and in cases of disagreement between them, with respect to the time of adjournment, he may adjourn them to such time as he shall think proper; he shall receive ambassadors and other public ministers; he shall take care that the laws be faithfully executed, and shall commission all the officers of the United States.

Sec. 4. The President, Vice-President, and all civil officers of the United States, shall be removed from office on impeachment for, and conviction of, treason, bribery, or other high crimes and misdemeanors.

ARTICLE III., Sec. 1. The judicial power of the United States shall be vested in one Supreme Court, and in such inferior courts as the Congress may from time to time ordain and establish. The judges, both of the Supreme and inferior courts, shall hold their offices during good behavior, and shall, at stated times, receive for their services a compensation, which shall not be diminished during their continuance in office.

Sec. 2. The judicial power shall extend to all cases, in law and equity, arising under this Constitution, the laws of the United States, and treaties made, or which shall be made, under their authority; to all cases affecting ambassadors, other public ministers, and consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be a party; to controversies between two or more States; between a State and citizens of another State; between citizens of different States; between citizens of the same State claiming lands under grants of different States, and between a State, or the citizens thereof, and foreign States, citizens, or subjects.

In all cases affecting ambassadors, other public ministers, and consuls, and those in which a State shall be party, the Supreme Court shall have original jurisdiction. In all the other cases before mentioned, the Supreme Court shall have appellate jurisdiction, both as to law and fact, with such exceptions and under such regulations as the Congress shall make.

The trial of all crimes, except in cases of impeachment, shall be by jury; and such trial

shall be held in the State where the said crimes shall have been committed; but when not committed within any State, the trial shall be at such place or places as the Congress may by law have directed.

Sec. 3. Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort.

No person shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court.

The Congress shall have power to declare the punishment of treason; but no attainder of treason shall work corruption of blood, or forfeiture except during the life of the person attainted.

ARTICLE IV., Sec. 1. Full faith and credit shall be given in each State to the public acts, records, and judicial proceedings of every other State. And the Congress may by general laws prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof.

Sec. 2. The citizens of each State shall be entitled to all privileges and immunities of citizens in the several States.

A person charged in any State with treason, felony, or other crime, who shall flee from justice, and be found in another State, shall, on demand of the executive authority of the State from which he fled, be delivered up, to be removed to the State having jurisdiction of the crime.

No person held to service or labor in one State, under the laws thereof, escaping into another, shall, in consequence of any law or regulation therein, be discharged from such service or labor, but shall be delivered up on claim of the party to whom such service or labor may be due.

Sec. 3. New States may be admitted by the Congress into this Union; but no new State shall be formed or erected within the jurisdiction of any other State, nor any State be formed by the junction of two or more States, or parts of States, without the consent of the legislatures of the States concerned as well as of the Congress.*

The Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this Constitution shall be so construed as to prejudice any claims of the United States, or any particular State.

Sec. 4. The United States shall guarantee to every State in this Union a republican form of government, and shall protect each of them against invasion, and, on application of the legislature, or of the Executive (when the legislature cannot be convened), against domestic violence.

ARTICLE V. The Congress, whenever two-thirds of both Houses shall deem it necessary, shall propose amendments to this Constitution, or, on the application of the legislatures of two-thirds of the several States, shall call a convention for proposing amendments, which, in either case, shall be valid to all intents and purposes as part of this Constitution, when ratified by the legislatures of three-fourths of the several States, or by conventions in three-fourths thereof, as the one or the other mode of ratification may be proposed by the Congress; provided, that no amendment which may be made prior to the year one thousand eight hundred and eight shall in any manner affect the first and fourth clauses in

the ninth section of the first article; and that no State, without its consent, shall be deprived of its equal suffrage in the Senate.

ARTICLE VI. All debts contracted and engagements entered into before the adoption of this Constitution shall be as valid against the United States under this Constitution, as under the Confederation.

This Constitution and the laws of the United States which shall be made in pursuance thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every State shall be bound thereby, anything in the Constitution or laws of any State to the contrary notwithstanding.

The Senators and Representatives before mentioned, and the members of the several State legislatures, and all executive and judicial officers, both of the United States and of the several States, shall be bound by oath or affirmation to support this Constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States.

ARTICLE VII. The ratification of the conventions of nine States shall be sufficient for the establishment of this Constitution between the States so ratifying the same.

Done in convention, by the unanimous consent of the States present, the 17th day of September, in the year of our Lord one thousand seven hundred and eighty-seven, and of the independence of the United States of America the twelfth.

AMENDMENTS.

ARTICLE I. Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press; or the right of the people peaceably to assemble, and to petition the Government for redress of grievances.

ARTICLE II. A well-regulated militia being necessary to the security of a free State, the right of the people to keep and bear arms shall not be infringed.

ARTICLE III. No soldier shall, in time of peace, be quartered in any house without the consent of the owner, nor in time of war but in a manner to be prescribed by law.

ARTICLE IV. The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated; and no warrants shall issue but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

ARTICLE V. No person shall be held to answer for a capital or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service, in time of war and public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb, nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation.

ARTICLE VI. In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been

committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusations; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defense.

ARTICLE VII. In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury shall be otherwise re-examined in any court of the United States than according to the rules of the common law.

ARTICLE VIII. Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishment inflicted.

ARTICLE IX. The enumeration in the Constitution of certain rights shall not be construed to deny or disparage others retained by the people.

ARTICLE X. The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

ARTICLE XI. The judicial power of the United States shall not be construed to extend to any suit in law or equity commenced or prosecuted against one of the United States by citizens of another State, or by citizens or subjects of any foreign State.

ARTICLE XII. The electors shall meet in their respective States, and vote by ballot for President and Vice-President, one of whom at least shall not be an inhabitant of the same State with themselves. They shall name in their ballots the person voted for as President, and in distinct ballots the person voted for as Vice-President; and they shall make distinct lists of all persons voted for as President, and of all persons voted for as Vice-President, and of the number of votes for each, which lists they shall sign and certify, and transmit, sealed, to the seat of the Government of the United States, directed to the President of the Senate. The President of the Senate shall, in the presence of the Senate and House of Representatives, open all the certificates, and the votes shall then be counted; the person having the greatest number of votes for President shall be the President, if such number be a majority of the whole number of electors appointed; and if no person have such a majority, then from the persons having the highest numbers, not exceeding three, on the list of those voted for as President, the House of Representatives shall choose immediately, by ballot, the President. But in choosing the President, the votes shall be taken by States, the representation from each State having one vote; a quorum for this purpose shall consist of a member or members from two-thirds of the States, and a majority of all the States shall be necessary to a choice. And if the House of Representatives shall not choose a President, whenever the right of choice shall devolve upon them, before the fourth day of March next following, then the Vice-President shall act as President, as in the case of the death or other constitutional disability of the President. The person having the greatest number of votes as Vice-President shall be the Vice-President, if such number be a majority of the whole number of electors appointed; and if no person have a majority, then from the two highest numbers on the list the Senate shall choose the Vice-President; a quorum for the purpose shall consist of two-

thirds of the whole number of Senators, and a majority of the whole number shall be necessary to a choice. But no person constitutionally ineligible to the office of President shall be eligible to that of Vice-President of the United States.

ARTICLE XIII., Sec. 1. Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction.

Sec. 2. Congress shall have power to enforce this article by appropriate legislation.

ARTICLE XIV., Sec. 1. All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States, and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws.

Sec. 2. Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice-President of the United States, Representatives in Congress, the executive and judicial officers of a State, or the members of the legislature thereof, is denied to any of the male inhabitants of such State being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion or other crime, the basis of representation therein shall be reduced in the proportions which the number of such male citizens shall bear to the whole number of male citizens twenty-one years of age in such State.

Sec. 3. No person shall be a Senator or Representative in Congress, or Elector of President and Vice-President, or hold any office, civil or military, under the United States, or under any State, who, having previously taken an oath as a member of Congress, or as an officer of the United States, or as a member of any State legislature, or as an executive or judicial officer of any State, to support the Constitution of the United States, shall have engaged in insurrection or rebellion against the same, or given aid or comfort to the enemies thereof. But Congress may, by a vote of two-thirds of each House, remove such disability.

Sec. 4. The validity of the public debt of the United States authorized by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States nor any State shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations, and claims shall be held illegal and void.

Sec. 5. The Congress shall have power to enforce, by appropriate legislation, the provisions of this article.

ARTICLE XV., Sec. 1. The right of the citizens of the United States to vote shall not be denied or abridged by the United States, or by any State, on account of race, color, or previous condition of servitude.

Sec. 2. The Congress shall have power to enforce this article by appropriate legislation.

CONSTITUTIONS, APOSTOLICAL. See APOSTOLIC CONSTITUTIONS AND CANONS.

CONSTITUTIONS OF CLARENDON. See CLARENDON, CONSTITUTIONS OF.

CONSTRUCTION (Lat. *constructio*, from *construere*, to construct, from *com-*, together + *struere*, to heap). In geometry, the process of drawing a figure so as to satisfy the conditions of the given problem. Thus, to construct an equilateral triangle of side *a*: with each end of *a* as a centre and with *a* as a radius, describe a circle; connect either intersection with the ends of *a*. Here the construction is not unique, since two triangles satisfy the condition. In solving problems a valuable method is to assume the construction and investigate the properties of the figure. Thus, to draw a line through a given point parallel to a given line: assuming the construction and a transversal of the parallels through the given point, it appears that the alternate angles are equal; hence, to construct the figure, draw a line through the point cutting the given line and construct the alternate angle.

Another fruitful method is that of the intersection of loci; e.g. if it is known that a point is on each of two intersecting straight lines, it is uniquely determined at their point of intersection; but if it is on a straight line and a circumference which the line intersects, it may be either of the two points of intersection.

The best works upon the constructions of elementary geometry are Petersen, *Methods and Theories* (Copenhagen and London, 1879); Rouché and de Comberousse, *Traité de géométrie* (Paris, 1900); and Alexandroff, *Problèmes de géométrie élémentaire*, translated into French by Aitoff (Paris, 1899). Consult also Beman and Smith, *New Plane and Solid Geometry* (Boston, 1899).

CONSUELO, kón-swá'lo. A famous novel by George Sand (1842) and the name of its chief character, a little Spanish girl abandoned in Italy, whose voice attracts the old maestro Porpora. Through him she is presented to Count Zustiniani, and the latter, after her successful debut on the stage, falls in love with her, but is repulsed. When her early lover Angoletto forgets her she is sent by Porpora to the home of a German family in Bohemia. Her entrance into this household prepares the way for the sequel, *La Comtesse de Rudolstadt*.

CONSUL (Lat., OL. *consul*, probably from *consulere*, to consult; less plausibly from *con-*, with + *salire*, to leap). The title given to the two chief magistrates established in Rome on the expulsion of the kings in B.C. 509. So violent was the hatred of the monarchy that the Romans were unwilling to intrust the new Republic to a single executive, but gave the entire administration to two consuls, of equal rank and jurisdiction, that each might check, if need were, any tyranny on the part of the other. At first the entire power of the King, in State and Church, at Rome and abroad, was vested in the two consuls, and each was wholly responsible for the acts of both; but gradually their powers were limited and many of their functions were given to other officials. They held office for one year only, and years were reckoned by their names. In the early days of

the Republic, one consul was generally commander-in-chief in the field, while the other remained to administer affairs at Rome; but often both were forced to lead the armies in battle. They presided at meetings of the Senate, at elections, and at the chief public festivals. As a mark of their high office they wore a white toga with a purple band (*toga prætexta*), sat in public in the 'curule chair' (*sella curulis*), and were accompanied by twelve attendants (*lictors*) bearing the *fascces*, or axe bound within a bundle of rods.

The consuls were elected at the *Comitia Censuriata* (see *COMITIA*). In the earlier period the date of the election and of the entering upon office was irregular and dependent on circumstances; but if convenient the election took place generally in July, and after B.C. 153 the consulship began regularly on January 1. At first only patricians were eligible to the office, and a consul could not be reelected. After a long struggle of the plebeians for recognition, it was established by the *Leges Licinia Sextie* (see *LICINIAN ROGATIONS*), in B.C. 367, that one of the consuls must be a plebeian. In 342 both consulships were opened to the plebs by a popular vote, and it was ordained that ten years must elapse before a consul could be eligible for reelection; however, it was not until 215 that two plebeian consuls were elected together, and one of these was quickly ousted. Not until B.C. 162 did the plebeians succeed in obtaining two effective consuls.

With the organization of the Empire by Augustus, the consulship ceased to be of real importance. In the division of functions between the Emperor and the senatorial body the consuls remained the head of the latter; but their nomination became a prerogative of the Emperor, and their election a farce. They still gave their names to the year, and the position was simply one of honor, so that we very often find several consuls named in succession in one year, the *eponymous* consuls holding office only for four, or even two, months, and then being replaced by others. The original pair were called *consules ordinarii*, their substitutes *consules suffecti*. Under the later Empire nothing but the name and honor of the consulship remained. The Emperor Honorius was made consul in the very year of his birth! Official dating by the name of the consuls came to an end in A.D. 537. Consult: Mommsen, *Römische Staatsrecht*, ii. (Leipzig, 1887-88); Daremberg et Saglio, *Dictionnaire des antiquités romaines*, vol. i. (Paris, 1892); Pauly-Wissowa, *Real-Encyclopädie der classischen Altertumswissenschaft*, vol. iv. (Stuttgart, 1839).

CONSUL, MERCANTILE. An agent appointed by one nation to reside within the territory of another for the special purpose of promoting commercial intercourse between them. The earliest prototype of this official is the ancient Greek *proxenus*, whose functions were to represent his country, and to protect its citizens while trading at the place of his residence. Modern Greek applies this term to the consul of to-day. That 'consul' has superseded 'proxenus' as the title of the international agent of commerce is due to the supremacy of Italian commerce in the Middle Ages. During that period Italian traders in a foreign country were accustomed to have their disputes settled by magistrates of their own upon

whom they conferred the proud title of 'Consul.' In 1485 Richard III. appointed the first consul for English merchants (Lorenzo Strozzi, at Pisa), being moved thereto, it is said, "by observing from the practice of other nations the advantage of having a magistrate for settling disputes among merchants trading in another country."

This judicial function of the early consul is maintained at present only in Oriental and African countries. In other lands his primary duties are those of an international commercial agent. The exact nature of his activities and the manner in which he is to perform them are determined mainly by the regulations of the Government appointing him.

The consular service of the United States embraces one consular agent and consul-general (located at Cairo, and enjoying a quasi-diplomatic position), consuls-general, vice-consuls-general, deputy consuls-general, consuls, vice-consuls, deputy consuls, consular agents, commercial agents, consular clerks, and office clerks, numbering, in 1902, over 1000 persons. Their salaries and fees amount to about two million dollars annually. Most of the fees (which aggregate nearly a million) are covered into the United States Treasury, but many consuls are paid for their services wholly or in part by fees. It is said that the American consuls-general at London and at Paris receive about \$20,000 each, although the salary is but \$5000. The number of consulates-general (July 17, 1902) is 44, of consulates 256, and of commercial agencies 25. As a rule, the incumbents of these offices are not allowed to transact business in or with the countries to which they are accredited, but a few of the consuls and commercial agents are exempted from this rule, because of their limited official income. Commercial agents are peculiar to the service of the United States and are not recognized by other countries as entitled to the rank or privileges of consuls. They are appointed by the President without confirmation by the Senate, and enter upon their duties without an exequatur from the Government in whose territory they reside. All other consuls are appointed by the President by and with the advice and consent of the Senate. They qualify by taking a prescribed oath of office, and by executing a bond to the United States for the faithful discharge of their duties and for accounting for, paying over, and delivering up all fees, money, goods, effects, books, records, papers, and other property coming to their hands. Upon filing the oath of office and the bond a commission issues, and a request is made by the State Department to the Government within whose jurisdiction the office is situated for an exequatur, upon the receipt of which the consular officer is entitled to perform his functions and enjoy the privileges of his station. The exact extent of these privileges depends upon the conventions or treaties existing between the United States and the countries to which they are accredited. In the absence of any convention, a consul, after receiving his exequatur, while not entitled to the exemptions of a diplomatic agent (see *DIPLOMATIC AGENTS*; *ALIEN*), is a recognized officer of a foreign State, under the special protection of international law; he may raise the flag and place the arms of the United States over his gates and doors; and his official papers and archives are exempt from seizure and destruction. While these duties

of consular officers pertain chiefly to commercial transactions, they are not limited to them. These officers "stand as protectors and advisers of their countrymen present in foreign lands; they act as judges, notaries, administrators of interests and of all property of such as have no legal representative; they have to prevent frauds on the revenue; to notice infractions of treaty stipulations relating to trade; to advise their Government of new laws or regulations within their district; to preserve the discipline of the commercial marine; to guard seamen from oppression; to aid the destitute; and to make reports upon matters affecting commercial, industrial, financial, and agricultural pursuits."

Some of the specific duties of consuls included under these general duties are: in connection with their control of the shipping of their country, the arbitration of disputes between master and crew, the relief of destitute seamen, the care of property of their countrymen in case of shipwreck, etc., the issuing of passports, the authentication of documents, and the certification of marriages, births, and deaths. The consuls of the United States are expressly prohibited from performing the marriage ceremony; but the statutes provide that when a marriage is duly solemnized in accordance with the law of the country in which the consul resides, the consul shall, upon proper application, issue a certificate of such solemnization, provided such persons would have been authorized to marry if residing in the District of Columbia, and the consul must forward a duplicate to the Department of State at Washington. Such a marriage is valid in the District of Columbia and in the Territories of the United States; but how far it is valid in the various States of the Union has not been judicially determined.

Ministers and consuls of the United States in China, Siam, and Madagascar have the judicial powers which are bestowed upon them by Chapter XLVII. of the Revised Statutes, including jurisdiction in minor criminal cases and in civil cases involving sums of \$500 or less. The personnel of the consular courts is specially determined, varying with the country and the subject matter under dispute; thus, in capital cases it is provided that the consul must sit with four of his countrymen as his associates, and that their verdict must be approved by the Minister before conviction can be had; and in some countries provision is made for a consular mixed court consisting of natives of the country and of the United States. Consuls have the judicial powers above referred to also in Turkey so far as relates to crimes and offenses of the citizens of the United States, and in civil cases where such powers are permitted by the laws of Turkey or its treaties with civilized nations or by its usages with the Franks or foreign Christian nations; and in Persia, as to suits and disputes between citizens of the United States. Special provisions exist granting special powers to the consuls of the United States in the Barbary States, Muscat, Samoa, and in some other places where treaty has provided for them. In China, Madagascar, Siam, Turkey, and other non-Christian countries the property of deceased persons, both real and personal, is administered under the probate jurisdiction of the consular courts of those countries. (The judicial powers of the United States Consul in Japan were terminated on July 17, 1899, by

the treaty with Japan which took effect upon that date.) Provision is made for an appeal from the consular courts under certain conditions to the Minister, and to the circuit courts of the United States.

Various attempts have been made during recent years to reorganize the consular service of the United States, but without success, and its consular system has remained practically unchanged since 1792. In 1895, and again in 1900, bills were introduced in Congress to provide a system by which persons shall be trained to the duties of the consular service, so that they shall be able to perform them in the best possible way at a reasonable expense to the Government. Fitness for the particular place, permanency of tenure, and promotion for efficiency were the principles upon which the new system was to be based. While Congressional action has not been secured, a step in the direction indicated by these bills was taken by President Cleveland in 1895, when he issued an executive order providing for an examination, by a board of three persons to be designated by the Secretary of State, of applicants for certain places in the consular service.

Consult: Warden, *On the Origin, Nature, Progress, and Influence of Consular Establishments* (Paris, 1813); Tarring, *British Consular Jurisdiction in the East* (London, 1887); the *Consular Regulations of 1896* (United States Public Document, Washington, D. C.); *House Report No. 562, Fifty-sixth Congress, First Session*; *Senate Report No. 1202, Fifty-sixth Congress, First Session*.

CONSULATE (Fr. *consulat*). The form of government in France from 1799 to 1804. After the sudden overthrow of the Directory on the 18th Brumaire (November 9, 1799), the members of the Council of Ancients and the Five Hundred, or rather such of them as approved of that act of violence on the part of Bonaparte, appointed three Consuls—Sieyès, Bonaparte, and Roger Ducos. Sieyès and Ducos were quietly got rid of by pensions and Cambacérès and Lebrun took their places. This approach to a monarchical government was confirmed December 24, 1799, by the Constitution of the Year VIII., by which Bonaparte was made First Consul. The Consuls were elected by the Senate for ten years, and were eligible for reelection. There was a Conservative Senate (*sénat conservateur*) of some sixty members appointed for life, a Tribunal of 100 members, and a Legislative Assembly of 300, but their powers were very limited, while those of the First Consul were made almost absolute. He promulgated laws and appointed or dismissed ministers, ambassadors, members of the Council of State, military and naval officers, and all civil and criminal judges, excepting justices of peace and members of the Court of Cassation. Bonaparte at once took up his residence at the Tuileries, and held a splendid Court. In May, 1802, he was reelected for ten years, and in August of the same year was made First Consul for life. Nothing but the imperial name and insignia were wanting to complete the picture of absolutism, and these were supplied May 18, 1804, when Napoleon was made Emperor. Consult: Hélie, *Les constitutions de la France* (Paris, 1875-80); Thiers, *Histoire du consulat et de l'empire* (Paris, 1845-62); and the various lives of Napoleon, the me-

moirs of the time, and general histories. See FRANCE; NAPOLEON I.

CONSULATE OF THE SEA. See CONSOLATO DEL MARE.

CONSUMERS' LEAGUE. An "association of persons who desire, so far as possible, to do their buying in such a way as to further the welfare of those who make or distribute the things bought." It recognizes that every one is a consumer; that the individual purchaser is indirectly a maker of goods and an employer of labor, and that as an individual he often has no test for goods. In harmony with the new political economy represented by Professor Patten, Professor Marshall, and others, which puts the emphasis upon consumption, the League offers a means of organizing and educating consumers to a knowledge of their responsibilities. The movement started in England in 1890. About the same time the Working Women's Society of New York was investigating the condition of women and cash-girls in the stores of that city. They called a public meeting in May, 1890, to ask the help of consumers in bettering these conditions, and as a result the Consumers' League of New York was formed in January, 1891. Similar leagues have since been organized in Pennsylvania, Massachusetts, Illinois, Minnesota, New Jersey, Ohio, Wisconsin, and Michigan. The work of the leagues has been principally: (1) to try to reform the conditions of workers in retail stores; and (2) to educate buyers, especially women. The leagues, according to the needs of their respective cities, drew up lists of conditions which a store must maintain in order to be called a 'fair house.' Some or all of the following points are considered: (1) wages (fines, time of payment, or minimum wage); (2) hours (length of working day and compensation for overtime); (3) vacations (week with pay, half-holiday during two summer months, legal holidays); (4) physical conditions (seats, sanitary work, lunch and retiring rooms); (5) humane treatment, appreciation of fidelity and length of service, and the employment of children. The stores that fulfill these conditions are placed on the 'white list.' Members of the League are urged to do their buying at these stores, and to show consideration for employees by courteous treatment and in the choice of purchasing hours.

The promoters of the League soon found that its work must be extended to reach the makers of goods, both to improve their conditions, and to protect the purchaser, who had no way to distinguish between factory-made goods and those made or finished in sweat-shops. Accordingly the National Consumers' League was organized in 1899 with Mrs. Florence Kelly, who had been a successful factory inspector in Illinois, as secretary. In order to identify the factory-made article a 'consumers' label' was adopted, which can be placed on goods made in factories maintaining the following conditions: (1) compliance with State factory law; (2) the manufacture of the goods on the premises; (3) no child under sixteen employed; (4) a ten-hour day; (5) permission given for inspection by a representative of the League. During its first year's work the National League, by means of the visits of its secretary, investigated factories making white goods. A list of fifteen factories was prepared whose conditions were satisfactory and whose owners were willing to use the label. The

National League has provided for the education of purchasers through lectures, the distribution of literature, and organization. The State leagues use similar methods, and, also, arrange parlor, church, and school talks. Although the membership of the League is still small, it is likely to prove an important educational factor in the community.

BIBLIOGRAPHY. Brooks, *The Consumers' League Reports* (New York, 1896, et seq.); Lowell, *Consumers' League* (New York, 1896); *North American Review*, 166 (New York, 1898); *American Journal of Sociology*, vol. v. (Chicago, 1901); *Annals of American Academy Bulletin*, N. S. No. 5 (Philadelphia, 1898); *Reports of National, Massachusetts, New York, and Pennsylvania leagues.* Literature may be obtained at the office of the National Consumers' League, 105 East Twenty-second Street, New York.

See FACTORY INSPECTION; SWEAT-SHOPS; UNION LABEL.

CONSUMPTION (Lat. *consumptio*, a consuming, from *consumere*, to consume, from *com-*, together + *sumere*, from *sub*, under + *emere*, to buy). One of the divisions—with production, exchange, and distribution—into which the subject of political economy is commonly divided. In the greater part of the works upon the subject, consumption follows the divisions above noted, and the subject has generally been treated in a stepmotherly fashion. It seems to have been assumed that the consumption of goods, the goal of all economic effort, sufficiently explains itself. Such treatment as is found deals with a few well-defined aspects. One of these has been the discussion of luxury, and the respective effects upon the economic order of wasteful and careful personal expenditure. In further examination of this subject attention has been called to the objects of personal expenditure. An examination of household budgets, especially those of the laboring classes, has given rise to an extensive and interesting literature. Attention was first directed to this line of investigation by the French economist Le Play and the German statistician Engel (q.v.). Much consideration has also been given under the head of consumption to the effects upon the economic order of the various forms of taxation.

It is obvious that consumption cannot be confined to the consideration of personal expenditure—that it is an integral part of the processes of production; and in this sense consumption has been defined as the 'withdrawal of goods from the market,' and would thus include not only direct consumption of goods for the satisfaction of immediate wants, but also the indirect consumption of goods in the production of other goods. It is this view of the subject which has in later years led to the attempt to correlate the phenomena of consumption more closely with the other economic processes. The stimulus seems to have been given by German economists, who have directed attention to the fact that the ultimate goal of all economic effort is the satisfaction of human wants. From this it was a natural step to a closer analysis of the human wants themselves, and this analysis has led up to the newer economic doctrine of which in England Marshall (q.v.), on the Continent of Europe the Austrian writers and in the United States Clark (q.v.) and Patten are the leading exponents. Their view is well stated in Marshall's

Principles of Economics (London, 1890-91), in which consumption or demand is given the first place in the discussion. The analysis of the forces which awaken the demand for goods, thus giving direction to the national production, has given rise to many new views in economics, and has reopened the discussion of fundamental principles. Such a development corresponds to the actual development of modern life in which the rapid strides of physical and mechanical science seem to have thrown for the time being questions of the limitations of human powers by physical conditions into the background. See EXCHANGE; POLITICAL ECONOMY; PRODUCTION.

CONSUMPTION. See TUBERCULOSIS.

CONTACT (Lat. *contactus*, from *contingere*, to touch, from *com-*, together + *tangere*, to touch). In geometry, two lines of which one at least is curved are said to be in contact when they have two or more consecutive points in common. E.g. in analytic geometry a tangent is said to be in contact with a circle in two consecutive points. This is called contact of the first order. If two curves have contact at three consecutive points, the contact is said to be of the second order, and so on; e.g. the curves $y = x^3$ and $y = 3x^2 - 3x + 1$ have contact of the second order. The analytic condition for contact of the first order at point $x = a$, between two curves, $y_1 = \phi(x)$, $y_2 = \psi(x)$, is that $\phi(a) = \psi(a)$, $(\phi)' = \psi'(a)$, ϕ' and ψ' being the first derivatives. The condition for contact of the second order is that $\phi(a) = \psi(a)$, $\phi'(a) = \psi'(a)$, $\phi''(a) = \psi''(a)$. Contact of the third order requires the derivative of the third order, and so on. In contact of the n th order between two surfaces, there must be $(n + 1)$ consecutive common points.

CONTACT-ACTION, CHEMICAL. See CATALYTIC ACTION; REACTION.

CONTACT DEPOSITS. See ORE DEPOSITS.

CONTAGION (Lat. *contagio*, contact, from *contingere*, to touch, from *com-*, together + *tangere*, to touch). The communication of a disease from the sick to the healthy, either by direct contact of a part affected with the disease, or by indirect contact through the medium of the excretions and exhalations of the body. Among the contagious diseases are measles, scarlet fever, smallpox, erysipelas, typhus fever, bubonic plague, epidemic influenza (the grippe), diphtheria, and tuberculosis. See BACTERIA; EPIDEMIC; INFECTION.

CONTAGIOUS DISEASES. The law takes cognizance of contagious and infectious diseases as they menace the public health, for the protection of which health and quarantine laws are enacted under the broad authority of the police power of the State. (See POLICE POWER.) For purposes of administration, this power may be delegated to municipal corporations or like political subdivisions.

While the right to take summary measures for the public safety is one of the most ancient of government prescriptions and is rarely challenged, yet it is none the less formidable, involving as it does the power of the State forcibly to confine those suffering from infectious diseases, even where properly cared for by friends or relatives, and other like interference with the personal rights of liberty and property. Maritime quarantine was early practiced by the com-

mercial nations, and was enforced by the Venetians in the fifteenth century; but municipal health regulation is of somewhat later development, and the two are still usually separated in administration. Thus, for instance, the Board of Health of the City of New York exercises jurisdiction within the city proper and upon the waters of the bay to the limits of quarantine, which, with its shipping, is under the authority of the Board of Quarantine Commissioners and the health officer of the port. In the United States the enactment of quarantine laws is held to be among the powers preserved to the States under the Constitution. Under their authority, however, State boards of health are created and general statutes passed delegating the power to local boards in cities, towns, and villages. In the larger cities this power is usually conferred separately by provision in their charter or act of incorporation. The public health laws of the several States are similar in character, and may be consulted for details. Violations of the sanitary code are usually made misdemeanors, and punished by imprisonment or fines. For the purpose of avoiding any questions that might arise from the possible interference of local regulations of the public health with the Federal prerogative of regulating interstate commerce, Congress early passed acts adopting such State laws and requiring their observance by Federal officials (act of February 25, 1799; act of April 29, 1878 [20 Stat. L. 37]). In 1879 a National Board of Health was created, but its powers were little more than advisory, and by the act of Congress, February 25, 1893 (27 Stat. L. 449), it was abolished and its powers and duties transferred to the Marine Hospital Service, which, under the direction of the Secretary of the Treasury, performs the functions of national quarantine. Questions pertaining to the people at large arising from immigration and importation belong to Federal jurisdiction as incidental to the constitutional right of regulating commerce. Thus conditions of entry are imposed, such as detention, inspection, and disinfection, and under the act of 1893 protective restrictions may even be laid upon interstate intercourse where a danger is threatened and State authority is wanting or lax. The Federal quarantine may arrest the entrance of forbidden persons or things; but once past the 'Barge Office' or custom-house, the local authorities take jurisdiction. Naval vessels as well as commercial are bound to observe quarantine rules.

In Great Britain a similar system of sanitary protection prevails. In England, the controlling statute, the Public Health Act (38 and 39 Viet. c. 55 [1875]), is comprehensive in its provisions and regulations, though it does not extend to Scotland or Ireland, or, except as to special provisions, to the city of London. The Infectious Disease (Notification) Act (52 and 53 Viet. c. 72) and the Infectious Disease (Prevention) Act (53 and 54 Viet. c. 34), as the titles signify, provide respectively for the course to be pursued in notifying the proper authorities in cases of defined contagious illness, and the regulations to be adopted in the way of inspection and disinfection to prevent infection. The first applies to the United Kingdom, and may be adopted by urban and rural authorities of ports and local districts; the second is confined to England.

In its international aspect, the obligation rest-

ing upon a State to adopt proper regulations to prevent the spread of epidemics belongs to the so-called natural duties, rather than the more defined and absolute principles of international jurisprudence. But with the increase of international intercourse and the development of a more sensitive national conscience, a demand has arisen among civilized nations for the recognition of the right to such protection by another State, as well as the long-established one of surrounding itself by defensive barriers. The United States has taken the lead in a commercial way by vigilant inspection of meats and like food exports. In 1879 Sir Shenstone Baker prepared a Code of International Quarantine, which was approved by the United States. See QUARANTINE; and consult the authorities referred to there and under POLICE POWER.

CONTARINI, kōn'tā-rē'nē. The name of a noble family in Venice, one of the twelve that elected the first Doge. Between 1043 and 1674, seven doges were furnished by this family, and several of its members were men of note. *Domenico*, Doge in 1043-71, was the first of the family to be invested with that dignity; during his reign the rebuilding of Saint Mark's Church was begun. *Andrea*, Doge in 1367-82, terminated the long war between Venice and Genoa by defeating the Genoese fleet at Chioggia. His return from this expedition was depicted by Paolo Veronese by order of the Republic. *Ambrogio* was Ambassador of Venice to Persia in 1473-77 and gave an account of his travels, published in Venice (1487). *Gaspuro* (1483-1542), cardinal and diplomatist, went as Venetian ambassador to the Diet of Worms in 1521, thence accompanied Charles V. to the Netherlands, England, and Spain, and in 1523 concluded the Emperor's alliance with Venice. In 1535 he was made cardinal by Pope Paul III., and as Papal legate to the Diet of Ratisbon, in 1541, made the most extensive concessions to the Protestants, endeavoring to bring about a reconciliation with the Catholic Church. Of his earnest efforts to introduce sweeping reforms in the latter, his *Consilium de Emendanda Ecclesia* (1537) is sufficient proof. The best-known of his other writings is *De Magistratibus et Republica Venetorum* (1543). *Giovanni* (1549-1605) was a painter of the Venetian School, who formed himself chiefly after the works of Titian and Palma the Younger. Called to Vienna by Emperor Rudolph II., he painted many portraits, but he is more noted for his historical compositions, among which are "The Doge Marino Grimani Adoring the Virgin," "Conquest of Verona by the Venetians," both executed for the Doge's Palace in Venice; and "Baptism of Christ."

CONTARINI FLEMING. A romance by Benjamin Disraeli (1832).

CONTÉ, kōn'tā', NICOLAS JACQUES (1755-1805). A French chemist and inventor, born at Aunou-sur-Orne (Orne). He was at first a painter, but afterwards turned to the mechanical arts, and, when France was deprived, through war with England, of its plumbago supply, invented a substitute in the shape of a mixture of graphite and clay. This substance he utilized for the manufacture of black-lead pencils, known as *crayons Conté*, by a process since followed in making all pencils. He also made extensive researches concerning the military aërostat, became director of the aërostatic school at Meudon,

and was appointed by Napoleon chief of the aërostatic corps of the French army of invasion in the Egyptian expedition. During that expedition his inventive genius proved to be of great service; for, after the reverse at Aboukir, the revolt at Cairo, and the consequent loss of instruments and supplies, he directed the manufacture of cloth, surgical instruments, bread, arms, ammunition, and other necessaries. He also devised (1798) a barometer, similar to the later one of Vidi. In 1802 he assisted in founding the Society for the Encouragement of National Industry. Consult Jomard, *Conté, sa vie et ses travaux* (Paris, 1852).

CONTEMPORANEITY (from Lat. *contemporaneus*, simultaneous, from *com-*, together + *tempus*, time). A term used in geology to imply that two formations were deposited during the same period of time. This does not necessarily mean that they must contain the same fossil species, nor is it likely that they will, except when the two areas of deposition are in the same basin. The term contemporaneity is sometimes confused with *homotaxy*, which means that certain formations occupy the same relative positions with respect to the development of life forms. Thus, certain formations of the Devonian in Europe and North America might show similar faunas, but not have been deposited at exactly the same time. They would be homotaxial. See GEOLOGY.

CONTEMPT (Lat. *contemptus*, from *contemnerē*, to despise, from *com-*, together + *tenere*, to despise). In law, any disobedience of, or disrespectful or disorderly conduct in the presence of, any court or legislative body. It is punishable because it tends to impair the dignity, power, and authority of such bodies, and thus interfere with the administration of the law, and generally the body concerned has an inherent power summarily to impose upon the offender a penalty of fine or imprisonment, or both. All courts have such power. The guilty person may usually have these penalties remitted by 'purging' the contempt; that is, by making pecuniary reparation, as far as possible, for any damage caused by his acts, and apologizing for his fault. If satisfactory, an order or minute is then entered reciting that this has been done and directing that the culprit be relieved from the penalty. Consult: Rapalje, *Treatise on Contempt* (New York, 1884); Oswald, *Contempt of Court, Committal, and Attachment, and Arrest Upon Civil Process* (London, 1895).

CONTEMPT OF PARLIAMENT. See PARLIAMENT.

CONTES À NINON, kōnt zā nē'nōn' (Fr., Ninon stories). A collection of short stories by Emile Zola, which were collected and published in 1864, when their author was only twenty-four years old. It was his first important work, and has been deemed by some critics his best book of short stories, being free from the exaggerations and brutalities which marked many of his later writings. In 1874 he published *Nouveaux contes à Ninon*.

CONTES DE MA MÈRE L'OYE, kōnt de mā mā lwä (Fr., stories of my Mother Goose). A famous collection of fairy tales by Charles Perrault (1697), purporting to be written by his ten-year-old son. The stories are taken from popular tradition, and are told in simple, child-

ish language, which has made them very successful among children for 200 years.

CONTES DES FÉES, dà fâ (Fr., stories of the fairies). A collection of fairy stories from various sources by the Comtesse d'Aunoy (1710), in which many of the tales received their literary form in French.

CONTES DRÔLATIQUES, drô'lâ'ték' (Fr., droll stories). A series of thirty tales by Balzac, abounding in Rabelaisian humor, and copying the style and spelling of the sixteenth century. They were published variously in 1832, 1833, and 1837.

CONTES DU LUNDI, du lôn'dé' (Fr., Monday stories). A collection of short stories by Alphonse Daudet (1873), of which *La dernière classe*, the touching story of the last school session held by an old French schoolmaster in Alsace before the German occupation, attracted much attention.

CONTI, kôn'té', HOÛSE OF. A younger branch of the House of Bourbon-Condé (see CONDÉ). It first appears in French history in the sixteenth century when François, son of Louis de Bourbon, first Prince of Condé, took the name of Marquis de Conti from his mother's fief of Conti-sur-Selles, in Picardy. Toward the end of the century he was made Prince of Conti. He died without heirs in 1614, and for sixteen years the title was in abeyance. In 1630 it was bestowed upon the infant Armand de Bourbon, second son of the Prince of Condé. This second Prince de Conti is generally regarded as the founder of the house. His son, Louis Armand, Prince de Conti, succeeded him, and on his death, in 1685, left the title to his younger brother, François Louis (1664-1709), who styled himself Prince de la Roche-sur-Yon et de Conti, and was the most noted member of the family. He had been educated under the eyes of the great Condé and embraced a military career with enthusiasm. He served in Hungary against the Turks, but, owing to incautious letters which he wrote home, he lost the favor of Louis XIV., and on returning was banished to Chantilly. Pardon through the intercession of the great Condé, the Prince served with distinction under the Duke of Luxembourg, and was present at the battles of Steenkerk (1692) and Neerwinden (1693). In 1697 he was put forward by Louis XIV. as a candidate for the Polish crown, and was in fact elected King by a part of the nobles, but found himself powerless against the opposition of Russia, the Emperor Leopold I., and the Pope, and abandoned his claim. Louis XIV. was never his friend, and feared Conti's popularity, so that the Prince spent his later life in retirement. In 1709, however, he was summoned to take command of the Army of Flanders, but was carried off by an attack of the gout, February 22, 1709. Massillon pronounced his funeral oration, and Saint-Simon, in his memoirs, speaks of him in glowing terms. His son was a worthless *roué* of the time of the Regency; but his grandson, Louis François (1717-76), Prince de Conti, distinguished himself as a brave and popular commander. The last member of the house was Louis François Joseph (1734-1814), Prince de Conti, son of the preceding, who, after a somewhat checkered career, died at Barcelona. Consult: Martin, *Histoire de France*, vols. ix., x,

xi. (Boston, 1864-66); *Mémoires de Fontenay-Mareuil, La Rochefoucauld-Doudainville* (Paris, 1861-64), and Saint-Simon (London, 1889); Topin, *L'Europe et les Bourbons* (Paris, 1868); *Mémoires of Noailles* (Paris, 1777); D'Argenson, *Mémoires* (London, 1893); and Bernis, *Mémoires* (Paris, 1878); De Broglie, *Le secret du roi* (Paris, 1879).

CONTI, AUGUSTO (1822—). An Italian philosophical writer, born near San Miniato in Tuscany. He studied law at several Italian universities and practiced in Florence until 1848, when he enlisted as a volunteer for service against Austria. Subsequently he practiced law and taught philosophy in San Miniato; in 1855 was made professor of philosophy in Lucca; in 1863 professor of the history of philosophy in Pisa, and in 1864 professor of mental and moral philosophy in Florence. His published works include: *Evidenza, amore e fede, o i criteri della filosofia* (1862, and subsequent editions); *Storia della filosofia* (1864, and subsequent editions); *L'armonia delle cose* (2 vols., 1878); *Filosofia clementare* (1869; ed. 9, 1879); *Dio come ordinatore del mondo* (1871); and *Il vero nell'ordine* (1876; 2d ed., 1891). In these and other works, Conti makes an earnest attempt to bring into agreement the teachings of different philosophical schools.

CONTI, NICCOLÒ DEL. An Italian traveler of the fifteenth century. He learned Oriental languages and carried on an extensive traffic in the East. He traveled in Egypt, Arabia, Persia, and India, and later gave a complete account of his travels to Poggio Bracciolini, secretary of Pope Eugenius IV. Poggio's manuscript relating the observations and adventures of Conti was first published in 1723, under the title *Historia de Varietate Fortuna*. Conti was one of the pioneers of European commerce in the East, and one of the first to advocate the idea of finding a western way by sea to the Eastern countries. Consult Giardina, *I viaggi di Niccolò de' Conti* (Catania, 1898).

CONTINENT (ML. *continens*, from Lat. *continere*, to touch, from *com*, together + *tenere*, to hold). The largest natural land division; of greater area than an island or peninsula. The outer portion of the earth is composed of two layers, the solid rocky crust, or 'lithosphere,' and the water areas, or 'hydrosphere.' In the early period of its history the earth may have been surrounded entirely by the hydrosphere, but at present, and, so far as known, in all geological ages, the crust has been folded into mountain chains, forming nuclei around which the continental land areas are grouped, while the waters have accumulated in the intermediate depressions. Geographers usually recognize as continents Eurasia (comprising Europe and Asia), Africa, Australia, North America, and South America; the two Americas, however, are sometimes grouped as a single continent, although such a classification is hardly justifiable unless Africa be included with the Eurasian continent. A sixth continent may be represented by the land areas in the Antarctic region (q.v.). It is estimated that the land constitutes about 55,000,000 square miles, or 28 per cent. of the entire surface of the earth. The continents vary widely in form, area, relief, and distribution on the globe, yet they may have many features

in common. Usually the regions of greatest elevation are found in the interior, while along the coast line there is a gentle slope outward which, continued beneath the sea, forms a slightly submerged land strip called the 'continental shelf.' On the seaward edge of the shelf the slope is very rapid down to the great depths of the sea. The average altitude of the continents, according to the calculations of Lapparent, Murray, Penck, Supan, and Heiderich, is shown below:

ESTIMATED AVERAGE ELEVATIONS OF THE CONTINENTS

CONTINENT	Lapparent	MURRAY	Penck	Supan	Heiderich
Europe.....	958	938	918	951	1,230
Asia.....	2,883	3,188	3,116	3,084	3,018
Africa.....	2,007	2,020	2,132	2,034	1,975
Australia.....	1,188	803	918	853	1,542
North America....	1,953	1,886	1,968	2,001	2,723
South America....	1,762	2,077	2,067	2,001	2,493

Between the form and distribution of the continents many interesting comparisons may be drawn. The two Americas, comprising the greater part of the land area in the New World, are triangular in shape, the apex of the one lying in the Isthmus of Panama and the apex of the other being represented by Cape Horn. Both continents are bounded on the west by a long mountain system and both have a region of lower elevation in the eastern portion. The Old World, on the other hand, is composed of a single triangular land area which has its base on the Arctic Sea and its apex at the Cape of Good Hope. Here the main trend of the mountain chains is east and west. In general, the continents that extend into or lie within the Southern Hemisphere—South America, Africa, and Australia—are most regular, contrasting strongly in this particular with North America and Eurasia in the Northern Hemisphere. The northern continents have a wider extension from east to west than the southern, and are further characterized by a great group of islands lying along the southeastern coast.

That the great land areas are not stable either as to form or elevation may be regarded as established beyond doubt by geological evidence. Moreover, certain coastal regions are known at the present time to be undergoing changes of level by which land emerges above or sinks below the sea. The extent of these oscillations in past ages can only be conjectured. Lyell's theory that there has been a constant interchange between the land and water areas has been objected to on the ground that there is no evidence that the abysmal depths of the ocean have ever been elevated; this objection has been weakened, however, by the discovery within continental areas of deposits abysmal in character and containing a deep-sea fauna. The changes of level between the land and the sea take place very slowly, and may be caused either by gradual vertical movement of the land area or by variations in the level of the ocean itself. Geologists generally agree that the positions of the present continents were determined as far back as Archæan times. The Laurentian plateau of North America, the Brazilian highlands of South America, and the Scandinavian peninsula and Lap-

land in Europe are composed of crystalline rocks, and except on the margins they are bare of all sediments. These primitive lands were extended in area by the deposition of sedimentary strata on their borders, and by great upheavals accompanied by foldings of the crust into mountain ranges.

The evolution of the continental lands can be studied only tentatively, and is largely conjectured from the evidence afforded by the characters of the fauna and flora that lived in past ages. During the Cretaceous and Tertiary times the animal and plant life of South America, South Africa, and India were strikingly similar, while there was also a uniformity between the life-forms of Europe and North America. This circumstance can best be explained by the assumption that in these periods the continents had an east and west trend, so that Brazil, Central Africa, and Lower India were united by one broad land-strip, and eastern Canada with Europe by another. Between the northern and southern continents an ocean basin extended from the isthmus of Central America eastward to the Indian Ocean, or nearly at right angles to the basin now occupied by the Atlantic. The changes by which the continents assumed their present form took place gradually and were accomplished by a slow depression of portions of the land and by encroachment of the sea. It is probable that certain regions for a long time remained above sea-level as large islands, the unsubmerged remnants of which still exist, for example, in the Cape Verde and Canary islands, in the British Isles, and in Madagascar. These changes were doubtless completed before the appearance of mankind; at least within historical times, so far as is known, there has been no marked alteration in the form of the continents.

BIBLIOGRAPHY. Suess, *Das Antlitz der Erde* (Leipzig, 1885-1900); Nemayr, *Erdgeschichte* (Leipzig, 1895); Mill, *The Realm of Nature* (New York, 1895); Mill, *The International Geography* (New York, 1900). See GEOLOGY; GEOGRAPHY; AMERICA; EUROPE; ASIA; AFRICA; AUSTRALIA.

CONTINENTAL CONGRESS. See UNITED STATES.

CONTINENTAL SYSTEM. The name given to the commercial policy adopted by Napoleon for the purpose of shutting England out from all connection with the Continent of Europe, and thus compelling her to acknowledge the maritime law as established at the Peace of Utrecht. This system began with Napoleon's famous Berlin Decree of November 21, 1806, which declared the British Isles in a state of blockade and prohibited all commerce or correspondence with them; every Englishman found in a country occupied by French troops or by their allies was declared a prisoner of war; all merchandise belonging to an Englishman was made lawful prize; and all trade in English goods was entirely prohibited. No ship coming directly from England, or from a British colony, was allowed to enter any port; and any ship seeking by false declarations to evade this regulation was confiscated with its cargo as if British property. England was not long in making reprisals. By an Order in Council, January 7, 1807, all neutral vessels were prohibited from trading from port to port within France or any country in alliance with it or under its control. Every neutral ves-

sel violating this order was to be confiscated with its cargo. Napoleon responded by a decree dated Warsaw, January 25, 1807, which ordered the confiscation of all English or English colonial merchandise found in the German Hanse towns. By a second Order in Council, November 11, 1807, all harbors and places in France and her allies in Europe and the colonies, as well as in every country with which England was not at war, but from which the English flag was excluded, were placed under the same restrictions as if strictly blockaded. These orders were followed by reprisals on the French side. By the Milan decree of December 17, 1807, strengthened by a second, of January 11, 1808, issued from the Tuileries, any vessel, of whatever nation, that had been searched by an English ship, or had submitted to be sent on a voyage to England, or paid any duty to the English Government, was to be declared denationalized, and treated as English. By the Treaty of Tilsit (1807) Russia consented to close her ports to English commerce, and in order the more effectually to annihilate such commerce, there appeared, August 3, 1810, the tariff of Trianon for colonial goods; this was extended by a decree of September 2; on October 18 followed the decree of Fontainebleau, ordering the burning of all English goods, an order which was to be carried out with more or less modification in all countries connected with France.

The consequence of the Continental System was undoubtedly the springing up upon the Continent of many branches of manufacture to the loss of England; on the other hand, the price of foreign goods rose to an extraordinary height, enabling a few merchants to make fortunes, but sensibly affecting the daily comfort of the middle classes. On the whole, the Continental System, both politically and economically, was a mistake. Russia abandoned it in 1810, and with the breaking up of Napoleon's power the system collapsed entirely. On the English side the enforcement of the Orders in Council gave offense to the United States, and was one of the principal causes of the War of 1812. Consult: Mahan, *The Influence of Sea Power upon the French Revolution and Empire* (Boston, 1894); Thiers, *Histoire du consulat et de l'empire* (Paris, 1845-62); Cime, *Etude sur les tarifs de douane et les traités de commerce* (Paris, 1875); Henry Adams, *History of the United States* (New York, 1889-91). See NEUTRALS; NAPOLEON I.

CONTINGENT (from Lat. *contingere*, to touch). A quota of troops, furnished to the common army by another branch of the service, or by different cooperating nations or armies. It was the naval contingent that saved the day in the defense of Ladysmith against the Boers in 1899. The various contingents of the international armies formed the common army under the leadership of Count Waldersee, the German commander, in the China campaign of 1900. The troops to be furnished by each of the United States under a call for volunteers by the President is its *quota*.

CONTINGENT REMAINDER. See REMAINDER.

CONTINUED FRACTION. See FRACTION.

CONTINUITY (Lat. *continuitas*, from *continuus*, uninterrupted, from *continere*, to hold
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together, from *com-*, together + *tenere*, to hold). In geometry, a vital principle which asserts that if from the nature of a particular problem we would expect a certain number of solutions, then there will be the same number of solutions in every case, although some may be imaginary. E.g. a straight line and a circle in the same plane intersect in two points real, coincident or imaginary. The sum of the angles of a quadrilateral is a perigon whether the quadrilateral is convex, cross, or concave. In this case, however, angles which have decreased and have passed through zero must be regarded as negative. By the principle of continuity theorems concerning real points or lines may be extended to imaginary points or lines. This change can take place only when some element of the figure passes through either a zero value or an infinite value; e.g. rotate an asymptote of the hyperbola about the origin; before rotation it cuts the curve in two infinite points; after rotation it cuts it in two real points or two imaginary points. In case of the real points rotate it still further, and these pass to infinity, and imaginary points occur. Many propositions of elementary geometry may be inferred from this principle. It was first stated by Kepler, emphasized by Boscovich, and put into acceptable form by Poncelet in his *Traité des propriétés projectives des figures* (2d ed., Paris, 1865-66).

More generally continuity is a philosophical concept exemplified in space and time. It has been defined as a series of adjacent parts with common limits; as, infinite divisibility; that is, that however small the segment between two points, a further division is possible; but in modern analysis continuity is the essential property of a continuum. By a continuum is understood a system or manifoldness of parts possessed in varying degree of a property *A*, such that between any two parts distant a finite length from each other an infinite number of other parts may be interpolated, of which those that are immediately adjacent exhibit only indefinitely small differences with respect to the property *A*. This is expressed by Cantor as a 'perfekt zusammenhängende Menge,' a perfect concatenation of points; e.g. all numbers rational and irrational in any interval form a continuum. A concatenation not perfect is called a semi-continuum; e.g. the rational or the irrational numbers in any interval. A straight line is said to possess continuity.

By the continuity of the roots of an equation is meant that as a result of certain variations of the function, different pairs of roots may during the process become equal or imaginary, the total number always continuing the same—an example given by Leibnitz. By the continuity of a function of *x* is meant the fact that indefinitely small and continuous changes in the value of *x* between certain limits produce indefinitely small and continuous changes in the function. Consult: Jordan, *Cours d'analyse* (Paris, 1893); Poncelet, *Traité des propriétés projectives des figures* (Paris, 1865-66); *Encyclopédie der mathematischen Wissenschaften*, vol. i. (Leipzig, 1901); Cantor, *Mathematische Annalen*, vols. xx. and xxi. (Leipzig, 1882-83); Mach, in *The Open Court*, vol. xiv. (Chicago, 1900).

CONTINUITY, LAW OF. A principle first formulated by Leibnitz (q.v.), which is expressed

in the Latin sentence, *Natura non facit saltum* ("Nature does not make sudden leaps"). It is opposed to the principle of discreteness, which asserts that all differences are hard and fixed, and that differences of kind are not differences of degree. Of late the significance of the law of continuity is coming more and more to be recognized. Indeed, it is the fundamental presupposition of all evolutionary thought, which maintains that all the differences of organic species and genera are differences appearing here and there in a continuum of variation, and that they get their discrete character from the disappearance of intergradient forms. The law of continuity may be illustrated in many ways. The solar spectrum, for instance, presents us with a series of colors which blend into each other in such a way that it is impossible to say where one color ends and another begins. Within this series we see many recognizably distinct colors; but this really means that red and blue are so different that a normal eye cannot confuse them. It does not mean that they are so different that no conceivable difference in degree can account for the difference in kind. In fact, it takes only a glance at the spectrum to see that the difference in kind is mediated by differences in degree, and that these latter are not abrupt and intermittent, but continuous and unbroken. By abstracting from the intervening colors and shades we can represent any detectable differences to ourselves as discrete, but this appearance of discreteness comes from failure to attend to the mediating shades. It is, however, to be observed that the continuity of the difference does not in the least prejudice the fact of difference. This truth can be stated in the following paradox: The colors and shades that *separate* two given colors in a spectrum also *unite* them. Generalizing this, we get the law that all intervenients while uniting separate, and while separating unite, the extremes between which they lie. See **IDENTITY**; and for the continuity of the states of aggregation of chemical substances, **CRITICAL POINT**.

CONTINUOUS SERVICE. See **ENLISTMENT**.

CONTORNIATE (It. *contorniato*, from *contorno*, contour, from ML. *contornare*, to go around, from Lat. *com-*, together + *tornare*, to turn, from *tornus*, Gk. *τόρνος*, *tornos*, lathe). A term applied to a class of antique medals which have a deep line cut round the edge, like a furrow, and are also marked by a strongly projecting edge. They show on one side a head, often of an emperor or other ruler, sometimes Homer, Sallust, Horace, or other authors, and on the other a scene from the circus or amphitheatre or from mythology or, rarely, daily life. No contorniate is known to be certainly earlier than the third century A.D., and most of them are even later. Many explanations of the use of contorniates have been given; the most probable is that they were counters in games, the reliefs on the sides being protected from contact with the board by the projecting rim.

CONTORTED STRATA. See **GEOLOGY**.

CONTOURS' (Fr., from ML. *contornare*, to go around). In topographical surveying and military sketching, the intersection of a hill by a horizontal plane. On topographical maps and military sketches hills are shown by contours, which are imaginary lines, generally represented

in red or black on the map, drawn round the hill at exactly the same level. Height is also shown by contours; on a map the distance between contours, commonly called the vertical interval, is always a fixed number of feet. The value of contours in a map or sketch to the engineer or military officer is that he is enabled to tell at a glance the slope of the ground to be traversed, and also whether the hills are gentle or steep, as the nearer together two contours appear on a map the steeper is the slope, and vice versa. See **SURVEYING**; and **ENGINEERING, MILITARY**. See article **MAP**, where contour lines are shown on the topographical map there given.

CONTRABAND OF WAR (It. *contrabbando*, Sp., Port. *contrabando*, from ML. *contrabannum*, contraband, from *contra*, against + *bannum*, *bannum*, proclamation, from OHG. *ban*, Ger. *Bann*, AS. *bann*, Engl. *ban*; ultimately connected with Lat. *fari*, Gk. *φῆσαι*, *phēnai*, to speak). Goods of such character as to be liable to seizure by a belligerent in trade between a neutral and the enemy in time of war. International complications arise over the definition of what, in a particular instance, constitutes contraband. To some extent this has been defined by treaty, especially by the United States, but the changes in methods of modern warfare render the list a constantly shifting one. Great Britain has adopted the classification of (a) *goods absolutely contraband*, and (b) *goods occasionally contraband*; i.e. making the decision depend upon the condition of being intended for warlike use. Under the latter head are included provisions, coal, horses, fittings for steam vessels, etc. Thus, in the case of a Swedish ship in the War of 1812 bound for the neutral port of Bilbao with a cargo of grain intended for the use of the British fleet lying there, the cargo was subject to confiscation as contraband. So coal came up for discussion in the Crimean War, Great Britain claiming it to be included under the head of *occasional contraband*. France in the war of 1859 refused to treat coal as contraband. The United States at the time of the Civil War adopted the English position, as did Germany in the war of 1870, while Russia follows France. Such differences threaten to furnish serious controversy in the event of war between any of the great commercial nations. The rules of international law provide that subjects of neutrals may carry contraband to either belligerent, but must do so at their own risk. So neutral merchants may trade in arms, ammunition, and stores in time of war as in time of peace, but either belligerent may capture such goods as are of direct and immediate use in war, if they cannot intercept them in their passage to the enemy while not within neutral jurisdiction. While a neutral is bound to prevent the departure of armed expeditions from its shores and the supplying of fighting gear to belligerent vessels in its ports, no duty is imposed of restraining contraband trade, though it has no right to interfere in behalf of subjects whose property is seized by one belligerent on the way to another, provided it belongs to the class of forbidden commodities.

Three requisites are necessary to constitute the offense of *carrying contraband*: (1) Sale and transport of contraband goods within a neutral territory is permissible, but they may not be sent across the frontier to a belligerent

by land or sea. (2) The goods must be intended eventually for a hostile destination. (3) The offense is completed with the deposit of the contraband cargo at the belligerent destination.

The ship when captured is generally taken to a prize court by the captor, and the penalty of conviction is the confiscation of the contraband goods, unless the owner of the contraband also has ownership in the vessel, in which case the ship, or his share therein, is likewise confiscated, and also any innocent goods of his ownership. False papers or misrepresentation as to destination may lead to the ship's condemnation. The carrying of agents or dispatches of an enemy must be distinguished as more properly unneutral service than carrying of contraband. The Trent Affair (q.v.) comes under the application of the rules relating to this question.

The term *contraband of war* was inappropriately though ingeniously applied during the Civil War by Gen. B. F. Butler, while in command at Fortress Monroe, to captured slaves, as a ground for retaining them when demanded by their Southern owners. Consult the authorities referred to under NEUTRALITY; BELLIGERENTS; BLOCKADE; INTERNATIONAL LAW.

CONTRA-BASS. See DOUBLE BASS.

CONTRA-BASS TUBA. See TUBA.

CONTRACT (from Lat. *contrahere*, to draw up, from *com-*, together + *trahere*, to draw). In English and American law, an agreement, enforceable at law, between two or more parties to do or not to do a particular thing. The elements essential to all forms of contracts are: (a) an obligation founded on the promise made by a party to the contract and resulting in his intent to enter into such an obligation; (b) a meeting of the minds of all the parties to the contract as to the terms and conditions of the promise given. Additional elements may be required to give solidity to various classes of contracts, as is pointed out below.

Classification.—Contracts are usually classified as: (a) contracts of record; (b) contracts by specialty; and (c) simple contracts.

Contracts of record, so called, are conclusive legal obligations created by the judgment or order of a court of record. Examples of contracts of record are judgments, recognizances, statutes staple, etc. They are not true contracts at all, as they do not contain a promise and are not founded upon the intention of the party bound, but should probably be classified as *quasi contracts* (q.v.).

Contracts by specialty are contracts depending for their validity upon the formality of their execution. They are required to be in writing and to be perfected by sealing and delivery by the party to be bound thereby. The usual form of specialty contract is by covenant (q.v.). A bond (q.v.), though in strictness not a contract, being an acknowledgment of indebtedness instead of a promise to pay, has always been regarded and classified as a specialty contract. Contracts by specialty require no consideration (q.v.) to give them validity. As in the case of other contracts, the courts of equity will not specifically enforce a specialty contract unless it is founded upon a consideration.

At common law the seal required to be placed upon specialty contracts was of great technical importance, but the law in this connection has

been greatly modified by modern statutes. In nearly all of the United States a scroll or mark with the pen may be used in place of a seal. In a number of States it is provided by statute that the seal upon a sealed instrument is only presumptive evidence of a consideration; the effect of which probably is to make a consideration necessary to the validity of a sealed instrument, at least where it is intended by the parties that a consideration is to be given. In a few States all distinction between specialty contracts and simple contracts has been abolished by statutes. The common-law form of action for enforcing all kinds of specialty contracts, except a bond, was the action of covenant (q.v.). Recovery upon a bond was secured by the common-law action of debt (q.v.). These distinctions are not preserved in modern systems of pleading. The usual period of limitation upon specialty contracts is twenty years.

Simple contracts are contracts which do not depend upon any particular formality as to execution for their validity, but upon the existence of a consideration, which is a detriment, or a surrender of a right, given in exchange for the promise. (See CONSIDERATION.) A simple contract may be in writing or by parole, or may even be implied from the acts and conduct of the parties manifesting their intentions.

As no formality is required in the creation of a simple contract, it always comes into existence as the consequence of an offer and acceptance. The offer must be accepted in accordance with its terms within a reasonable time, or within the time stated in the offer, in order to give rise to a contract. A refusal to accept, or a counter-offer, puts an end to the first offer, which cannot thereafter be accepted. In contracts entered into by letter, in most jurisdictions, the offer is deemed to be accepted upon the posting of the letter of acceptance, but in a few States it is held that there is no acceptance until the letter of acceptance is actually received by the person making the offer. Inasmuch as there must be an agreement in order to create a contract, any mistake as to the time of the offer or acceptance will prevent a meeting of the minds of the parties and no contract will arise. But a mistake as to some collateral matter will have no effect upon the contract unless induced by fraud, in which case the defrauded party may rescind the contract. Thus, if A offers to sell property to B for \$10,000, and B accepts, understanding the offer to be \$5,000, no contract arises; but if B understands the offer made and accepts it because he erroneously believes the property is of much greater value, a contract does arise. Simple contracts are frequently classified as *express* and *implied*. An express contract is one entered into on terms expressed in spoken or written words. An implied contract is one which is inferred from the acts or conduct of the parties. The latter should not be confounded with the so-called contracts implied in law, as, for example, the obligation to repay money paid by mistake, which are not true contracts, because not based upon intention. They are properly classified as *quasi contracts* (q.v.). Express contracts may be by parole or in writing, the only difference in legal effect being in the method of proof. (See EVIDENCE.) A few simple contracts are required, however, by the Statute of Frauds (q.v.) to be executed in writing. Simple contracts are further

classified as *unilateral* and *bilateral*. A unilateral contract is one in which one party to the contract makes a promise in exchange for the other party's giving something or doing some act. A bilateral contract is one in which each of the two parties gives his promise in exchange for the promise of the other, the promise of each being a consideration for the promise of the other.

Contracts are also said to be *executory* or *executed*. An executory contract is one which has not been fully performed. As the performance of a contract terminates its existence as a legal obligation, it will be observed that the expression 'executed contract' is a contradiction of terms. A present sale of personal property is sometimes said to be an executed contract, but the expression is improper, as the sale may be effected by a mere meeting of the minds without any promise, and, hence, without contract. See SALES.

Performance.—In the case of all true contracts, whether by specialty or simple contracts, the obligations of a party to perform may not arise until the happening of a condition, or the performance of his promise by the other party, as expressly or impliedly provided in the contract by its terms. If there be no such provision in the contract, by certain settled rules of construction (known as the law of conditions) implied in law, the performance of one party may be deemed a condition precedent to the performance of the other, or the performance of each of the parties may be a concurrent condition to the performance by the other; that is, each party must tender his performance before he can recover damages for the breach of contract by the other. In general, impossibility of performance is no defense to an action brought to recover damages for breach of contract. If, however, the contract contemplates the continued existence of the parties or the subject-matter of the contract, the death of a party of failure of subject-matter is a defense. Thus, in contracts for personal service, death of the employer or employee terminates the contract, and a contract for the use of a particular building or other property is terminated by the destruction of the property.

Suits upon Contracts.—Owing to the rule of pleading in actions upon contract at common law, the plaintiff must show that he has given consideration for the defendant's promise. A third person for whose benefit the contract was made, but who was not a party to it, could not sue upon it. This is still the rule in most jurisdictions, although not in all; and in a few, notably New York, in the single case when A gives money or property to B upon his agreement to pay money to C, C may sue upon the contract upon the theory that a debt has been created in his favor. Equity exercises jurisdiction to compel specific performance of a contract when legal damages would be inadequate. It also exercises its powers to rescind or reform written contracts affected with fraud or mistake. Fraud is also a defense at law to an action founded on contract, it having been early adopted by the courts of law, although it is a defense equitable in character. Contracts which contravene rules of public policy or statutory enactment are illegal and void. See ILLEGALITY.

Contracts in the Civil Law.—In the Roman law contract (*contractus*) signified an agreement which created an actionable obligation. The original roots of contractual obligations were

apparently pledge and vow. In the first case, the debtor gave the creditor a pledge, which the creditor held until the debtor had fulfilled his promise. If a debtor had nothing else to pledge, he pledged his own person in the form of a sale. This transaction the Romans called *accum*. It created something analogous to a judgment debt; and as the debtor was in default, the creditor levied on his body (*manus iniectio*). At the time of Gaius this contract was antiquated. A vow to the gods to do something for or pay something to the third person enabled the priest to intervene and insist upon performance—from this root sprang the sacral contract of the priestly law, the *sponsio*, and out of the *sponsio* grew the sacral contract of *stipulatio*.

At the time of Gaius (early Empire) five classes of contracts were recognized: (a) The *verbal* contract, *stipulatio*, which was actionable because a certain form of words (question and answer) had been observed. It was usual to draw up a written statement (*cautio*) reciting the terms of the agreement, but the validity of the contract rested on the exchange of the spoken words. (b) The *literal* contract (from *littera*, writing). This was actionable because a formal entry had been made in the creditor's ledger (*expensilatio*). In the case of the verbal and the literal contract it was neither the agreement alone nor the form alone which created obligation, but the two together. (c) The *real* contract. This was actionable because something (*res*) had passed from the creditor to the debtor, and the return of the thing or an equivalent had been promised. To this class belonged the bailments known as *mutuum*, *commodatum*, *depositum*, *pignus*. (See BAILMENT.) Besides these there were many other real contracts without special names. Ultimately it was recognized that any agreement for reciprocal performances would become a binding contract as soon as one party had performed. (d) The *consensual* contract. This was actionable by virtue of the agreement (*consensus*) between the parties, although no form had been observed and nothing had passed. There were only four contracts of this class: *emptio venditio*, sale; *locatio-conductio*, hiring; *societas*, partnership; and *mandatum*, commission of agency.

Agreements that fell in none of these four classes were simple pacts (*pacta*), not contracts, and were not actionable. Such pacts might, however, be available for defense, e.g. when a creditor had given his debtor an informal release or an extension of time, and pacts made immediately after the conclusion of a contract (*pacta adiecta*) were treated as part of the contract.

In order that a contract should be valid it was necessary that the parties should be of such age as to be capable of binding themselves, and of sound mind, and that the object to be attained should be neither impossible, illegal, nor immoral. Mistake (*error*) was regularly fatal to the validity of a contract, provided the mistake was excusable and essential. A mistaken reason or motive for contracting was not regarded as essential. Where, however, the mistake was caused or utilized by the other party, these limitations disappeared and the contracts were voidable for fraud (*dolus*). Duress (*metus*) also made a contract invalid.

In modern European codes, all agreements except those looking to impossible or immoral ends are valid and actionable, unless a special form is

required by law and the required form has not been observed. It is therefore maintained by many writers that the Roman category of real contracts has disappeared, and that there are now but two classes, the formal and the consensual. The formal contracts of the modern codes are not Roman. Where a form is prescribed, it is usually a written document, and in many cases attestation by a notary is necessary to its validity.

BIBLIOGRAPHY. For special branches consult the authorities referred to under the titles treating of those subjects, as REAL PROPERTY; SALE; MORTGAGE, etc. Also consult: Parsons, *Law of Contracts* (8th ed., Boston, 1893); Anson, *Principles of the Law of Contract* (7th ed., Oxford, 1893; 2d American ed., Chicago, 1887); Chitty, *Treatise on the Law of Contracts* (13th ed., London, 1896); Addison, *Treatise on the Law of Contracts* (7th ed., London, 1893); Marrison, *Elements of Contracts* (2d ed., Boston, 1901); Hollingsworth, *The Law of Contracts* (1896); and the authorities referred to under such special titles as QUASI CONTRACT; NEGOTIABLE INSTRUMENTS; SALE, etc.

CONTRACTION (Lat. *contractio*, from *contrahere*, to draw up). The wish or necessity for economizing labor and parchment led the scribes of the Middle Ages to use a great many abbreviations or contractions in their manuscripts. These contractions were transplanted into the first printed books; and more recently they have been reproduced in many works, where it was thought desirable that the modern print should represent as nearly as possible all the peculiarities of the ancient manuscript. A knowledge of contraction, therefore, is indispensable, not only to readers of old writings, but to readers of the printed books of the fifteenth, the sixteenth, and the earlier part of the seventeenth centuries, and to all who desire to avail themselves of the vast stores of historical and archeological materials accumulated in the rolls and records published by the governments of Great Britain, France, and other countries. This subject is treated in detail under PALEOGRAPHY.

Contraction may be divided into six classes: (1) contraction, properly so called; (2) contraction by elision or suspension; (3) contraction by writing a smaller letter above the word contracted; (4) contraction by running two or more letters into one character; (5) contraction by symbols representing syllables or words; (6) contraction by initial letters.

CONTRACT SURGEON. In the United States Army, a civilian physician or dental surgeon, employed under contract with the Surgeon-General of the army. Civilian physicians and dentists may be employed as contract surgeons and contract dental surgeons under contracts entered into by, or with the authority of, the Surgeon-General of the army. They are entitled to the transportation and fuel allowances of first lieutenants, and when on duty at a post or station where there are quarters belonging to the United States, they receive the quarters in kind allowed by regulations to an assistant surgeon of the rank of first lieutenant; they are not entitled to commutation of quarters, nor to the ten per centum increase of pay when serving beyond the territorial limits of the United States. They are entitled to the same official obedience from enlisted men as regularly

commissioned officers, and may be detailed on councils of administration and boards of survey, act as post treasurer, etc., and witness payments to enlisted men under the provisions of paragraph 1502 to 1527 of the Regulations, but may not be detailed for duty on courts-martial. Generally expressed, the contract surgeon's eligibility for duty is the same as that of an assistant surgeon, except in so far as it is limited by the fact that he is not a commissioned officer. Candidates for appointment as dental surgeons must be not less than twenty-four, nor more than forty years of age, and must be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral character, and, prior to appointment, will be required to pass a satisfactory professional examination before a board of dental surgeons, convened for that purpose. Contracts with dental surgeons are made for three years, but may be annulled, for cause, at any time. They are attached to the medical department, and are assigned to duty in accordance with the recommendations of the Surgeon-General of the army, or the chief surgeon of a military department. A dental surgeon is allowed, as an assistant, one enlisted man from the Hospital Corps, and must operate between the hours of 9 A.M. and 4 P.M. upon soldiers entitled thereto only. Before and after these hours, he is free to pursue his private practice.

The United States is the only country in the world employing army dental surgeons. For detailed information as to the duties, privileges, etc., of contract surgeons, consult *Army Regulations War Department* (Washington, 1901). See SURGEON, MILITARY.

CON'TRA-FAGOT'TO (It., counter-bassoon). The name in orchestral scores for the double bassoon. See BASSOON.

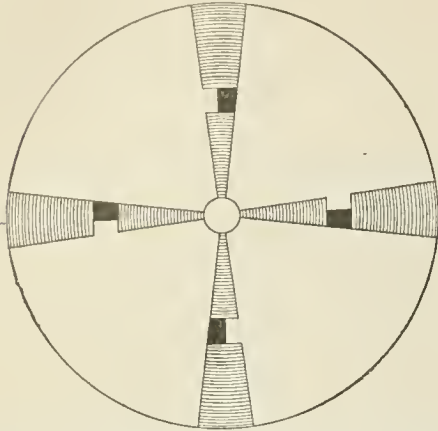
CONTRAL'TO. See ALTO.

CONTRARY MOTION. See MOTION, in Music.

CONTRAST (Fr. *contrasté*, from ML. *contrastare*, to withstand, from Lat. *contra*, against + *stare*, to stand). The enhancement of the difference between objects or attributes of objects which results from their juxtaposition or immediate comparison. Contrast has been employed, very loosely, as a principle of explanation in psychology; and we cannot even now say that the whole field of 'contrast phenomena' has been adequately explored. It is, clearly, no explanation of a given fact to refer it to a general law of contrast, any more than it is an explanation of a mental connection to refer it to the 'association of ideas.' We must know, in each particular case, the conditions under which the fact is determined and the connection takes shape.

(1) One chapter of the psychophysics of contrast may, however, be considered closed. This is the chapter that deals with the contrast of brightness and colors. If we lay two black strips upon a gray ground, and then push a white cardboard under one of them, so that the white projects on either side, we see at once that the black on white is blacker than the (same) black on gray. If we lay a gray disk upon a red ground of the same brightness, and stand so far away that the contour of the disk is eliminated, we see a bluish-green in place of the gray disk; and the color is most intensive

along the line of junction of disk and ground. These experiments may be varied in many ways.



Disks for mounting upon the color-mixer, to show brightness and color contrast. The black portions of the disks are black, the white portions white, and the shaded portions of some color. From Helmholtz, *Physiol. Optik* (1896.)

The principal laws of contrast, as determined by such experiments, are five in number: (a) Contrast always takes the direction of greatest opposition. A white induces a black, a color its complementary color. (See VISUAL SENSATION.) (b) The more saturated the color (the redder the red, the purer the white), the greater is the contrast effect. (c) The contrast effect is greatest along the line of junction of the contrasting surfaces (marginal contrast). (d) The more nearly alike two colors are in brightness (both bright, or both dull), the better will be the contrast effect. And (e) the more nearly homogeneous the contrasting surfaces (the less distinction there is at the line of junction), the better will be the contrast effect. Helmholtz sought to explain these facts, in purely psychological terms, as deceptions of judgment; we see aright, but estimate wrongly; and Wundt accepts the explanation for certain of the phenomena. The psychological theory, however, breaks down when one attempts to carry it out in detail. There can be no doubt whatsoever that, as Hering maintains, contrast of color and brightness is a matter of direct physiological conditioning, the result of the interaction of excitations within the visual organ, a symptom or expression of the functional unity of the retina.

(2) Whether contrast occurs in the perceptual sphere; whether, e.g. 'great' and 'small' contrast as do blue and yellow, is a much-disputed question. There are certain optical illusions (see ILLUSIONS) which seem to be most easily 'explained' by reference to a law of space contrast. In its most direct form, the theory of spatial contrast affirms that "the space sensation of a stimulated retinal point is a function primarily of the position of the point stimulated, but also of the space sensations of the neighboring retinal elements" (Loeb); the formula that holds of sensation is thus applied, without modification, to the sphere of visual space-perception. It has been said, again, that lines of different direction exercise 'contrastive' influences upon the movements of regard, i.e. upon the movements made by the eyes as we

attentively follow the course of the lines (Heymans). And, lastly, it has been asserted that figures of the same size, surrounded by like figures of another size, look larger 'by contrast' if the surrounding figures are smaller, and smaller if these are larger (Wundt). Most of these illusions can, however, be otherwise explained; and, despite the array of authorities, the fact seems to be that a given perception is never really changed by contrast with other perceptions. 'Perceptual' contrast' consists rather in a feeling. When we see a middle-sized man by the side of a dwarf, we are surprised at his height; when we see him by the side of a giant, we are disappointed in his height. Our perception of the man's height is not affected by the neighborhood of smaller and larger men; the contrast that we 'feel' is felt, literally, as surprise or disappointment.

(3) Many psychologists, again, assume the existence of an affective contrast (see AFFECTION); a particular pleasure appears more pleasant if it follows a preceding unpleasantness, and vice versa (Fechner, Höföding, Lehmann). The affective value of a stimulus, however, is not constant, as is its sensation value, but varies with the present state of the organism and the corresponding disposition of consciousness. The 'particular' pleasure, then, is not a determinate amount of pleasantness, that may 'seem' to be greater or less according to its affective setting. The pleasure actually aroused may differ within wide limits, while the stimulus remains the same. Moreover, where there is affection, there is also sensation; where there is affective contrast there must also be a 'perceptual contrast,' in the sense just defined of the conditions of the arousal of a contrast-feeling. It is, then, perhaps safer to give up the idea of an 'affective contrast' altogether.

(4) Lastly, we must note that, in certain psychological systems (Wundt, Höföding), the law of contrast figures as a general law of the mental life. Wundt, e.g. speaks of the 'law of psychical contrasts' as one of the three psychological laws of relation; all "volitional processes . . . are arranged in groups made up of opposite qualities; . . . these opposites obey in their succession the general law of intensification through contrast. . . . The law is secondarily applied to ideas and their elements." The rejection of this law does not necessarily carry with it the rejection of spatial and affective contrast; though its acceptance would naturally incline us to accept the alleged illustrations of its working.

Consult: Fechner, *Vorschule der Aesthetik* (Leipzig, 1876); Lehmann, *Hauptgesetze des menschlichen Geföhllebens* (Leipzig, 1892); Wundt, *Outlines of Psychology* (Leipzig, 1898); Höföding, *Outlines of Psychology* (London, 1891); Titchener, *Experimental Psychology* (New York, 1901); Wirth, in *Zeitschrift für Psychologie*, vol. xviii. (Leipzig, 1898).

CONTRAT SOCIAL, kŏn'tră' sŏ'se'äl'. See ROUSSEAU, JEAN JACQUES.

CONTRAYERVA (Sp. *contrayerba*, antidote, from *contra*, against + *yerba*, Lat. *herba*, Engl. *herb*). A medicine once in much repute against low fevers and as a mild stimulant and diaphoretic, but not used in the United States. It consists of the rootstocks (rhizomes) of different

species of *Dorstenia*, tropical American plants of the natural order Moraceæ. The genus is remarkable for the plane receptacle in which the numerous small flowers are fixed; the male flowers in superficial depressions, the female flowers in deep sockets. The flowers have neither calyx nor corolla. The fruit consists of achenia, imbedded in the fleshy receptacle from which they are projected by elastic force when ripe. *Dorstenia contrayerva* is a perennial plant with palmate leaves and somewhat quadrangular receptacles. Its rootstock is knotty, one to two inches long, about one-half inch thick, reddish-brown, pale within, sending out on all sides many slender fibres (roots), which are generally loaded with small brown knots. It has a peculiar aromatic, overpowering smell, and a somewhat astringent, warm, bitter taste. It keeps badly. It contains so much mucilage that a decoction of it will not pass through a filter. *Dorstenia Brasiliensis*, a stemless species, with oblong, heart-shaped leaves, and a circular receptacle, a native of the West Indies and Brazil, possesses similar properties, but is said to be more energetic. Other species possess similar properties. They have been also represented as efficacious against serpent-bites, and hence the name 'contrayerva,' a counter-poison.

CONTRERAS, kón-trá-rás. A village about 12 miles southwest of the City of Mexico, the scene, August 19 and 20, 1847, during the Mexican War, of an important battle between a Mexican force of 7000 under General Valencia, supported by another of 12,000 under General Santa Anna, and a United States force of 4500 under General Scott. The Mexicans occupied a strong position on high ground and fought for a time with great gallantry, but, being attacked both in front and rear at daylight on the 20th, finally gave way and fled in confusion, after having lost in killed and captured over 1500. The American loss in killed and wounded was reported by General Scott at 60. Consult Wilcox, *History of the Mexican War* (Washington, 1892), and *Autobiography of Lieutenant-General Scott* (New York, 1864).

CONTRERAS, HERNANDO DE (c.1520-50). A Spanish adventurer, a son of Rodrigo de Contreras, Governor of Nicaragua. After the confiscation of his father's property, he plotted revenge by organizing, in company with his brother Pedro, an expedition against Peru, which he determined to seize as his inheritance, tracing his claim somewhat remotely to certain rights of his grandfather, Pedrarias, the former Governor of Nicaragua. After murdering the Bishop of Nicaragua, they captured Panama, April 20, 1550, and took a large part of the treasure left there by the licentiate Gasca. While Hernando was pursuing Gasca, who was already on his way from Peru to Spain, the citizens of Panama retook the city, and pursued the brothers. Hernando was shortly afterwards drowned (May, 1550) while endeavoring to make his escape, and Pedro fled into the interior of the country, where every trace of him was lost.

CONTRERAS, JUAN SENEN DE (1760-1826). A Spanish soldier. He was born in Madrid, studied military matters in England and various Continental countries, and took part, in 1788, in the campaign of Austria against the Turks. In

the War of Independence he greatly distinguished himself, in particular at Talavera and at the defense of Tarragona, where he was captured by the French. He was imprisoned in the Castle of Bouillon, but escaped thence in 1812, and made his way to London, whence he returned to Spain in 1814. He wrote an account of the siege of Tarragona which appeared in Paris in 1825 as volume iii. of the *Mémoires relatifs aux révolutions de France et d'Espagne*.

CONTRIBUTION (Lat. *contributio*, from *contribuere*, to contribute, from *com-*, together + *tribuere*, to grant, from *tribus*, tribe; probably connected with *trabs*, beam, Umb. *trēfu*, Welsh *trēf*, village, Goth. *þawrp*, AS. *þorp*, OHG. *dorf*, Ger. *Dorf*, village). In the law of war, a levy of money or supplies imposed by an invader upon the citizens of an enemy's territory entered. The term *requisition* is usually applied to a levy of supplies, which may consist of food, forage, clothing, or means of transport. Contributions are an outgrowth of the old conditions of pillage and devastation which formerly marked the course of an invader. Private property in land early became exempt from seizure owing to immovability; but personal property, being of a portable character, was appropriated so as to impair the enemy's strength. This custom reached its height during the seventeenth century, when armies of adventurers swept over Europe, depending upon the country for support. Gradually, with the growth of more humane feelings and the more practical reason of increased efficiency and discipline in armies, the custom hardened into the usage of permitting inhabitants of invaded territories to purchase immunity from plunder by payment of a money indemnity.

A contribution is of the nature of an extraordinary tax (regular taxes being appropriated as public property by the enemy), and though it is levied primarily by the invader, it is administered by local representative authorities, and its incidence is thus regulated. Modern usage has approved the giving of receipts or '*bons de requisition*' for the sums or quantities taken, to guard against burdensome demands by later commanders; also to furnish a basis for recovery from the domestic government in the event of national division of the loss. Yet the State is not generally held liable for losses entailed by contribution; but these losses are considered to have happened from superior force beyond the State's control, except when a certain territory has been given over to an enemy to protect the rest of the country. In that case justice demands a different rule. Effort has been made by international convention to modify the usage of exacting contribution, and modern warfare has relaxed its severities, though during the Franco-Prussian War it was rigorously enforced by Prussia. The Allies made no levies in the Crimea, nor did the United States in Mexico in 1847. The British also generally purchased supplies from the Boers. In each of these cases, however, this conduct appears to have been dictated by motives of momentary policy. Contribution should be distinguished from tribute, which is usually a condition of peace exacted by treaty. Consult the authorities referred to under WAR. See TAX; TRIBUTE; CONQUEST.

CONTRIBUTORY NEGLIGENCE. See NEGLIGENCE.

CONTRITION (Lat. *contritio*, grief, from *contrecere*, to bruise, from *com-*, together + *terere*, to rub). Sorrow for sin. As a term of Roman Catholic theology, it signifies "a sorrow of mind and a detestation for sin committed, with the purpose of not sinning for the future." A smaller degree of sorrow, arising from "the consideration of the turpitude of sin, or from the fear of hell and of punishment," is called attrition.

CONTROLLER (variant of *comptroller*, which see for etymology). On shipboard, a contrivance for holding the anchor-chain and keeping it from running out while getting up anchor or mooring. It is made in two parts, one of which slides vertically. When this part is up the chain slips freely over the jaws of the controller; when the movable part is lowered the chain drops in a slot, where it is caught and held. For further security, the controller usually has an arch-shaped iron strap above it; this keeps the chain in place and has sockets for a heavy bar which holds the chain down against the jaws.

CON'ULA'RIA (Neo-Lat. nom. pl., from Lat. *conus*, cone). A genus of fossil Pteropoda of curious form found abundantly in some Paleozoic rocks, and rarely in Permian and Triassic beds. The shell, when perfectly preserved, has the form of an elongated quadrangular pyramid of which the sides are flattened and the edges sharp. In size they vary from one-half to ten inches in length. The surface is ornamented by numerous transverse ridges, and the interior is divided by septa in the apical portion. The aperture is closed by four in-curved lobes, which are extensions of the sides of the pyramid. Certain forms in the Utica slate of New York State, originally described as algae, have been shown to be sessile Conularia, in which the young remain attached to the parent shell to form a colony with the appearance of a branching seaweed. Consult: Ulrich, *Beiträge zur Geologie und Paläontologie von Südamerika, I. Paläozoische Versteinerungen aus Bolivien* (Stuttgart, 1892); Ruedemann, "Notes on the Discovery of a Sessile Conularia." *American Geologist*, vol. xvii. (Minneapolis, 1896). See also PTEROPODA.

CONUNDRUM (probably a pseudo-Latin word; hardly from Lat. *conandum*, thing to be attempted, from *conari*, to attempt). A pun in the interrogative form, a kind of riddle (q.v.) involving the discovery of some odd or absurd resemblance between things utterly dissimilar, or of some odd difference between similar things. The conundrum is usually in the form of a question, the answer to which either is or involves a pun. A good example is the following: Q. When is it easiest to read? A. In the autumn, when Nature turns the leaves. The conundrum has almost entirely supplanted the riddle, save in folklore and savage life.

CON'VALLA'RIA. See LILY-OF-THE-VALLEY.

CONVECTION OF HEAT, CONVECTION CURRENTS. See HEAT, *Expansion*.

CONVENTICLE (Lat. *conventiculum*, dim. of *conventus*, assembly, from *convincere*, to assemble, from *com-*, together + *vincere*, to come). (1) The private religious meetings in the early Church. Later (2) a cabal among the monks of

a monastery formed to secure the election of a favorite as abbot; the word consequently fell into disrepute. (3) It was given as an appellation of reproach to the assemblies of Wielif's followers, and was afterwards applied (4) to the meetings of English and Scottish Nonconformists. In this connection the legal term developed. The Conventicle Act of 1864 made all assemblies for religious purposes, other than those of the Church of England, illegal, permitted houses to be searched for suspected conventicles, and imposed the penalty of transportation for repeated offenses.

CONVENTION (Fr., from Lat. *conventio*, a coming together, a meeting, from *convincere*, to meet, from *com-*, together + *vincere*, to come). In the civil law, a contract, pact, or treaty. Hence, in more general usage, a rule of conduct depending upon agreement, express or implied, rather than on any positive rule of law. Thus, we speak of the *conventions* of a constitution, meaning those parts of it which are the result of custom and of general agreement, as distinguished from the *law* of the constitution, which is embodied in statutes or in judicial decisions. The term is also employed in a technical sense, in the language of diplomacy, and in military affairs, with the signification of treaty or agreement respecting the conduct of military operations or the relations of the contracting parties to one another.

In the political sense, the term 'convention' signifies an extraordinary assemblage of delegates, representing the people of a State or the members of a political party, for other purposes than the regular functions of government. Thus, a regular legislative body is not a convention, though the term is sometimes applied to the joint meetings of the two Houses of a State Legislature when convened for the formal election of a United States Senator. The two Houses of Parliament constitute a convention, whether acting jointly or severally, if assembled without authority of law. This was the character of the two 'convention Parliaments,' as they were called, which met in 1660 to restore Charles II. to the throne, and in 1689 to alter the succession from the House of Stuart to William and Mary. In both of these cases the illegal and revolutionary acts performed were afterwards validated and confirmed by regular acts of Parliament. Of a similar character was the convention by which the first French Republic was declared in 1792, and under which the Revolution was carried on till the establishment of the Directory in 1795.

CONSTITUTIONAL CONVENTIONS. The fact that conventions may be made up of delegates representing the whole body of the people of a State, and chosen specifically to represent the popular will in a particular matter, has made them a favorite instrument for framing a new scheme of government or for amending an old one. The convention is thus a more immediate representative of the people, with a higher and more imperative mandate than the legislature. There has been only one national constitutional convention in the United States—that which framed the Constitution; but the high character of this assemblage, the patriotic spirit and wisdom which animated it, and the astonishing success which has attended its labors, have made it the immortal type of such gatherings. In the Unit-

ed States its members are revered as the 'Fathers of the Constitution.'

This convention met, pursuant to the call of the Congress, in Philadelphia, on the 14th of May, 1787, to frame measures for the preservation of the union of the States and the establishment of a stable and efficient government; and, under the presidency of George Washington, it completed its labors on the 17th of September. It included most of the men of authority and influence in the country, among them such well-known figures as Alexander Hamilton, Benjamin Franklin, James Madison, Roger Sherman, Robert Morris, Elbridge Gerry, and Rufus King, and all but one (Rhode Island) of the original thirteen States were represented in its deliberations and in the final vote by which the Constitution was adopted. The Constitution (art. v.) provides for its own amendment by the process of a convention called upon the demand of two-thirds of the States; but the greater ease and simplicity of the alternative method, of proposing amendments to the several States by a two-thirds vote of the two Houses of Congress, has caused the latter method to be preferred. See CONSTITUTION OF THE UNITED STATES.

In the States composing the American Union, however, the convention method of amending their constitutions has usually been followed. The ordinary procedure is for the Legislature to call a convention to be chosen by vote of the electors, and providing for the submission of the results of its work to the Legislature, and then to the people for ratification. In many cases the proposed amendments are submitted directly to the people, without previous reference to the Legislature, and in at least one recent case (Mississippi, 1890) an amended constitution was promulgated and put into effect by the constitutional convention which framed it, without ratification by the people or the Legislature. Doubtless such amendment, by convention only, is valid, if the powers of that body are not limited by the statute calling it into existence. But where the Legislature, in calling a convention, prescribes for the submission of its conclusions to the Legislature or the people, or both, for ratification, the amendments do not acquire the force of law until such ratification has been had. See Jameson, *Treatise on Constitutional Conventions* (4th ed., Boston, 1887).

POLITICAL CONVENTION. A gathering of delegates representing a political party for the purpose of placing in nomination the candidate of that party for an elective office. The method of holding elections is carefully regulated by statute in all communities in which public offices are filled by popular vote, but the method of nominating candidates for such offices is usually left to the initiative of the voter. Under the party system which prevails in most popular governments, the process by which candidates are selected and placed in nomination is usually supervised by the party organizations seeking to control the election. In Great Britain candidates for Parliament are named by committees composed of party leaders, and in the early history of the United States the necessary leadership was supplied by party committees in Congress. Nominations for the Presidency were made in this way until 1824. At the present time, however, nearly all nominations for elective offices in

the United States, whether great or small, are made by the primary and convention systems. The primary is the meeting of the electors themselves, at which delegates to the nominating conventions are chosen. In some instances, however, the system is more complicated, the voters at the primaries choosing delegates to local conventions, and these, in their turn, electing delegates to represent the party in State or national conventions. The enormous extension of this system is doubtless due to the ease and completeness with which it lends itself to partisan control of elections, and thus of the machinery of government. It has doubtless done much to build up the system of party domination and the power of the great party leaders. The party organization, controlling the primaries, makes up a convention of its partisans and dependents, and thus dictates the nominations for office, leaving to the voter no choice but that of supporting or rejecting the candidate of his party. Then, when the party organization of city, county, or State, through a refinement of these methods, becomes wholly subservient to one man, we have the 'boss' system as it exists and flourishes in this country at the present time. In some of the States attempts have been made to render the primaries and conventions more truly representative of the body of the voters by statutory regulation of the nominating machinery, especially in the direction of providing for independent nominations without the employment of primaries and conventions, but thus far without much success. The political convention continues, and is likely to continue, the usual and favorite method of procuring nominations for office.

National conventions—for the nomination of candidates for the Presidency and Vice-Presidency of the United States—were first held about seventy years ago. The Anti-Masonic Party (1828-32) was the first political party to perfect the national-convention system, and that party held the first national convention in the Presidential campaign of 1832. Both factions of the Democratic-Republican Party had, however, held nominating conventions that were not national nor systematically representative during the campaigns of 1824 and 1828. The collapse of the Congressional nominating caucus in the campaign of 1824 hastened the development of the convention system. Political conventions, like most other representative bodies, usually reach their conclusions by a majority vote of the delegates present. The national conventions of the Democratic Party, however, are governed by a peculiar rule, requiring a two-thirds vote for a candidate in order to secure the nomination. Another practice, peculiar to the machinery of the Democratic Party in nominating its candidates for the Presidency and Vice-Presidency, is the 'unit rule,' as it is called, under which certain State conventions bind the delegates of those States in the national convention of the party to cast the unanimous vote of the delegation according to the wishes of the majority of its members.

Although the principal business of political conventions is the nomination of candidates for office, they have, in the course of American political development, become the councils of the great parties, and in and by them the principles of political action are formulated and declared.

The 'platforms,' as they are called, adopted at State and national conventions, constitute the declarations of policy of the parties making them, upon which they seek the verdict of the people at the ensuing election. This declaration of principles has become one of the most important functions of political conventions, and often constitutes the principal part of their work. See ELECTION; NOMINATION; POLITICAL PARTY. Consult Bryce, *The American Commonwealth* (ed. 1895).

CONVENTION, NATIONAL (Fr. *convention nationale*). The third assembly of the deputies of the French people chosen after 1789, and the one which assumed the government of France on the overthrow of the throne in 1792. After the Legislative Assembly had decreed the suspension of the King, August 10, 1792, it voted the election of a National Convention, which commenced its sittings on September 21, immediately after the dissolution of the Legislative Assembly. Its first act was to declare the abolition of the kingship, and to make France a republic. Upon this followed the trial and condemnation of the King. Through the support of excited mobs, the extreme Jacobin Party became predominant in the Convention, where, from the elevated seats on which its members sat, it received the name of the Mountain. (See MONTAGNARDS.) The Revolutionary Tribunal and the Committee of Public Safety were created by this party. The Girondists (q.v.), at first a powerful party, were destroyed, many of them perishing by the guillotine; and a new Constitution, thoroughly democratic, was adopted August 10, 1793. Its operation, however, was suspended until peace should be restored. Meanwhile the rulers in the Convention displayed marvelous energy, almost a million citizens being placed under arms, and immense supplies of military stores being raised by means of continual requisitions. By order of the majority of the Convention, thousands of its political opponents were thrown into prison, and the number who died by the guillotine increased daily both in Paris and throughout France. In the end the National Convention became subject to the dictatorial power of Robespierre, and independent opinion was no longer expressed. The overthrow of Robespierre was followed by a great reaction; the Jacobins were suppressed; and finally, the remnant of the Convention, after concluding peace with Prussia and Spain, dissolved itself, October 26, 1795, leaving to the nation a new Constitution, which placed the Government in the hands of the Directory (q.v.). During its long lease of life the National Convention had passed over eight thousand decrees and acts, and had set into motion forces which profoundly influenced the history of France and of Europe. Consult Barante, *Histoire de la convention nationale* (2 vols., Paris, 1851-53). See FRANCE; DANTON; HEBERT; MARAT; ROBESPIERRE; etc.

CONVENTIONAL. In art, a term which indicates that a work has been produced in accordance, not with the absolute principles of beauty in form and color, but with the theories and rules concerning forms and colors which chance to prevail at a given time or in a given country or social class. An artist who adheres too rigidly to such rules is said to be conventional. The term is also used to describe representations of natural ob-

jects; as, for example, leaves which are not strictly true to nature. Such representations are frequently used for decorative effect, and the objects are said to be conventionalized.

CONVENTION PARLIAMENT. A British term for a Parliament convened without royal authority. The English sovereign has a vested prerogative in the assembling of Parliaments, but when the Crown is in abeyance convention Parliaments meet—as before the restoration of Charles II. (1660), and when William and Mary were offered the sovereignty after James II. had fled the kingdom (1689). The acts of such Parliaments are subsequently ratified by a Parliament summoned in due form.

CONVERGENCE. See SERIES.

CONVERSANO, kōn'vēr-sā'nō. A city in southern Italy, in the Province of Bari, situated on an eminence about 20 miles southeast of the city of that name, and 5 miles from the Adriatic coast (Map: Italy, M 7). It is the seat of a bishop, has a beautiful cathedral, a minnery, and a castle which belonged to the family of Acquaviva. A trade in wine, oil, flax, cotton, and almonds is carried on. Population (commune), in 1881, 11,890; in 1901, 13,685.

CONVERSAZIONE, kōn'vēr-sā'tsê-ō'nā. (It., conversation). A gathering for social purposes and conversation, where amateurs and others may meet for interchange of ideas on literature, art, or science.

CONVERSION (Lat. *conversio*, from *convertere*, to turn, from *com-*, together + *vertere*, to turn; connected with O-Church Slav. *vrătĭti*, Skt. *vart*, to turn, Goth. *wairpan*, AS. *wearpan*, OHG., Ger. *werden*, to become). In logic, the transposition of subject and predicate in a proposition—e.g. "No S is P" becomes by conversion "No P is S." Conversion is *simple* when no other change is made in the original proposition than the transposition of subject and predicate. It is *limited* or *accidental* (*per accidens*) when the quantity of the proposition is reduced from universality to particularity—e.g. "All S is P" becomes by limited conversion "Some P is S." Simple conversion here would be unwarranted. Conversion is *by contraposition* when it is preceded by obversion (q.v.). The proposition obtained by conversion is called the *converse* of the original proposition. See LOGIC.

CONVERSION. As a term of the common law, the unauthorized assumption of the powers of the true owner over goods or personal property. The act of conversion may consist either in the destruction of the property, the sale or transfer of it to a third person, or the use of it as owner. For example, a person converts the horse of another by wrongfully shooting it; an auctioneer or agent for B converts the furniture of A by selling it as the property of B, although he may believe that it is B's property; a manufacturer converts A's cotton or wool when he makes it into cloth, even though in good faith he thinks the cotton or wool is his own; a person who wrongfully draws out a gallon of liquor from a cask and fills up the cask with water converts the entire quantity. In each of these cases the converter wrongfully assumes the dominion over the property of a true owner, and exercises it to the exclusion of the true owner. The mere loss of property by a carrier, or its

deterioration because of careless storage by a warehouseman, is not conversion, as neither carrier nor warehouseman in such case exercises an act of ownership over it.

The common-law action by the owner against the converter was that of *trover* (q.v.), so called from the French *trouver*, to find, because the declaration contained an averment that the defendant had found the property and had thereafter converted it to his own use. This averment, being in most cases fictitious, is no longer employed, and the action is now spoken of as that of conversion rather than of *trover*.

The amount of damages recoverable in an action of this kind is generally the value of the plaintiff's interest in the property at the time of the conversion. Whether the defendant has the right to reduce damages by tendering the property to the plaintiff is a question upon which the courts in this country are not agreed. Upon principle it would seem he has no such right. In case the property is still in possession of the converter, the owner has the option of reclaiming or of suing for damages. If he resorts to the latter alternative, obtains judgment, and collects it, the title to the converted property vests in the defendant. But neither in England nor in this country does title vest in the defendant without the plaintiff's assent, unless the judgment is satisfied. See **TORT**; and consult the authorities there referred to.

Conversion of property in equity is quite a different thing from the common-law tort, which we have been considering. In equity, real property is treated as converted into personalty, and personal property into realty, where the owner has properly expressed his intention that such an alteration should take place. Land may be converted into the purchase money, in equity, by a contract to sell; it may be converted into personalty, also, by a devise in a will to sell it and distribute the proceeds. As equitable conversion works a radical change in the legal character and the devolution of property, the intention of the owner to effect such a conversion must be clearly manifested.

The conversion of land into personalty is also brought about in the administration of the estates of bankrupts or of intestates, generally under statutory provisions. The land is sold by trustees or administrators, and the proceeds applied to the payment of debts. Conversion is applied, by some authorities, to the change of partnership debts, with the consent of creditors, into the debts of one partner, or the change of a partner's debts into those of the firm. See **EQUITY**; and consult the authorities there referred to.

CONVERTER. A device used in metallurgy, and consisting of a receptacle holding iron which is to be converted into steel. It is a vessel usually of spherical shape, lined with fire-clay, the bottom having numerous holes through which a powerful blast is driven during the process. From this vessel the liquid steel is poured into molds. The converter forms an essential part of the Bessemer process, which is described at length under **IRON AND STEEL**. The apparatus is also employed in copper-melting. See **COPPER**.

CONVEX. See **CONCAVE**.

CONVEYANCE (from *convey*, OF. *conveier*, *convoier*, Fr. *convoyer*, from ML. *conviare*, to accompany, from *com-*, together + *via*, way; con-

nected with Lith. *veza*, wagon-track, Skt. *vaha*, road, Goth. *wigs*, OHG. *wec*, Ger. *weg*, AS. *weg*, Engl. *way*, from Lat. *vehere*, Skt. *vah*, to carry). The technical term for a transfer of real property the word having in law retained its earlier English meaning of a transfer, or passing, of a thing from one to another. It comprehends all manner of transfers—whether by livery of seizin, judgment of law, or deed—whereby any interest in land is vested in another, but it is strictly applicable only to transfers *inter vivos*, and does not include devises of land by will, or the devolution of an estate upon the heir by descent, or to the husband and wife of their estates and dower, or to the State of its right by escheat or forfeiture; neither does it include involuntary transfers of property, as by bankruptcy, the creation of judgment or statutory liens, etc. It is, thus, a term of much narrower signification than *alienation*, and somewhat more restricted than *common assurance*, though it is much wider than the term *grant*, as it includes transfers of interests which do not require, or which cannot be effected by, that process. A lease for years, even though made by parol, is a conveyance, and so is a mortgage, a declaration of trust, a marriage settlement, the creation of a power affecting land, etc. The term is also applied to the transfer of title to vessels, but not to the alienation of other species of personal property. The general substitution of written for parol and ceremonial transfers of land, effected by the Statute of Frauds (29 Car. II., c. 3, 1676), has made the term *conveyance* one of common application to the instrument of transfer, as well as to the transaction itself.

The difficult and technical character of the law of real property appears at its worst in the complicated processes which have from time to time been developed for transferring such property. The earlier methods of the common-law system depended for their efficacy largely on the notoriety of the transaction, the feoffment, or livery of seizin, being a public ceremonial, and the subsequently devised processes of 'levying a fine' and 'suffering a recovery' being attended with the publicity of judicial proceedings. These 'notorious' conveyances, as they were termed, have in modern times given place to more convenient modes of transfer, which are called 'secret' conveyances. This salutary change has been brought about by the general substitution of written deeds of transfer, which take effect upon delivery, for the older and more formal methods, and the form and style of these deeds, formerly in the highest degree technical and complicated, have in recent years been greatly simplified by statute. The general prevalence of registry acts and of the practice of recording in the United States does not affect the secret character of the conveyance, as such, this being complete upon the delivery of the deed, the object of the recording being only to guard against a subsequent fraudulent transfer of the same property.

The earlier modes of conveyance at the common law, besides their notoriety, and in part as a consequence thereof, had the extraordinary operation of transferring a greater estate in the land than the transferer himself had. That is to say, a tenant for life or years might by feoffment convey the premises in fee simple to a

stranger. It is true the fee thus conveyed was a defeasible one; but it placed the landlord—reversioner or remainderman—in the situation of a disseizee, and forced him into the disadvantageous position of a plaintiff seeking to recover his land from one who claimed it under a notorious public conveyance. This was called a 'tortious,' or wrongful, conveyance, and the term tortious was thus applied to all the earlier modes of alienation which possessed this curious power. Conveyances by deed, on the other hand, have never been attended with these consequences, have never possessed a tortious operation, and have, therefore, been distinguished as 'innocent' conveyances. Whatever they may purport to do, they pass only such interest as the grantor can lawfully convey. All modes of conveyance are now of this character, the older conveyances and the tortious effect of them having been done away with, both in England and in the United States, by statute. A curious survival of this obsolete and discredited doctrine appears in the modern American doctrine of conveyance by estoppel (q.v.). Notwithstanding the improvements which have been effected in recent years in the substitution of secret for notorious conveyances and the simplification of the former, the conveyance of land continues to be a much more cumbrous, uncertain, and expensive operation than the transfer of personal property. Many suggestions have been made looking to the elimination of these objections and the assimilation of the two species of property in this respect, and in several of the United States and in some of the British colonies different systems for achieving these objects have been adopted and are now on trial. These will be explained under the titles LAND TRANSFER: REGISTRATION OF TITLE. See the several titles of the various modes of transfer referred to in this article, and in addition, ALIENATION; CONVEYANCING; TITLE; WARRANTY; and the authorities there referred to.

CONVEYANCING. The act or art of preparing the deeds or instruments used for the transference of property from one person to another. As such writings not only form the evidence of the right of the person possessing or claiming possession of property, but do in themselves constitute the title thereto, it is of the greatest importance that the conveyancer employed to prepare them should be possessed of a competent knowledge of the law and have the skill required to frame them in such a form as clearly to express and attain the object intended. In the early stages of society there is no call for the profession of a conveyancer; property is held in right of occupancy, without any written title, and even lands are conveyed from one to another without writing, the new owner being usually put in possession in presence of witnesses called for the purpose, by some symbolical form, such as the delivery of earth and twigs.

In the early history of the Jews, the symbolical mode of transferring title prevailed (Ruth iv. 7). But they subsequently developed a much more artistic system of conveyancing, making use of all the safeguards that are used in modern times—viz. writing, witnesses, subscribing, sealing, and recording the documents (Jer. xxxii. 9-12). In Rome, as elsewhere, early transfers of property, whether land or goods, were of

a ceremonial character. Later, a distinction was made between property capable of transfer by a simpler process (*res nec mancipi*) and such as could be effectually transferred only by the older and more formal method (*res mancipi*). It was not until Justinian's reign that the distinction between the two classes of property was abolished and a simple form of conveyance made sufficient for both.

Strictly speaking, the term *conveyancing* has no application to the various modes by which the title to chattels is transferred. These processes have almost always been of the simplest character, and do not even to-day usually call for expert knowledge or for elaborate writings to render them safe and effective. It is to the feudal system of land tenures, and to the complexities and refinements which it introduced into the simple notion of ownership, that we owe the difficulties and dangers which attend the transfer of title to land at the present time. As the feudal system nowhere exercised a stronger and more persistent influence than in England, so there is no country in Europe in which the conveyance of lands is as complicated and precarious an undertaking as it is in that country and in most of the United States. The number and variety of estates and other interests which may exist at one and the same time in the same parcel of land, and the diversity of circumstances under which these varied interests may arise, may be transferred and extinguished, have combined to make conveyancing one of the most technical and difficult branches of the work of the legal profession. In England it has resulted in the development of a special branch of lawyers who are known as conveyancers. In the United States the process of specialization has not gone so far as that, the business of conveyancing being still for the most part in the hands of the profession at large.

The process through which the conveyancer must go may be briefly described. He has first to make a careful search of the public records and from these to prepare an abstract (q.v.) of the title to the land in question. He must then examine with the greatest care all of the documents constituting the chain of title, in order to determine their validity and sufficiency. He will then be prepared to draw up the appropriate document to effect the transfer desired—which may be a deed of trust, a marriage settlement, a grant of the lands, or a last will and testament. In England, where no system of general registration of land titles is in force, the conveyancer has recourse to the original documents of title, which are carefully preserved and transferred with the land.

The complexity, uncertainty, and expense of the old method of conveyancing have long called for radical reform. In England, in the United States, and in Canada, land transfer reform associations exist, and are vigorously pushing for legislation in this direction; something has already been achieved, but much remains to be done. Few even of professional conveyancers would deny the truth of the statement made by the Duke of Marlborough in the *Fortnightly Review*, that heretofore "in every country the theory of the land laws has depended on the fact that land was never intended to be dealt with by free commerce and barter, and its sale and ex-

change have at all times been surrounded with legal difficulties of every description." As property is subdivided into smaller and smaller portions, and as the number of conveyances which make up the chain of title to a piece of real estate continually increases, the difficulty and cost of establishing a clear title becomes more and more burdensome. An illustration of this is given by a New York newspaper, which points out that when the famous Jumel estate in New York was disposed of, it was divided into 1383 pieces and sold to over 300 buyers; each of these had to engage a lawyer to search carefully through every old deed, mortgage, and record relating to the entire property, picking them out from 3500 volumes of deeds and mortgages in the office of the New York City Registrar; here it is clear that 299 out of 300 parts of the total labor and expense were wasted. The same writer asserts that in New York City the amount thus expended is over one per cent. of the total value of the property transferred, and that at least half of this is unnecessary waste. So great has the task of searching and verifying titles become in New York and other large cities that land-title guarantee companies have been formed, which insure purchasers and mortgagees against flaws in titles; the companies make a business of searching records, and sometimes have elaborate analyses and abstracts of real estate records, costing them many scores of thousands of dollars.

In the United States the system of conveyancing generally adopted is that by deeds of grant, or bargain and sale; many States have enacted statutes simplifying the old method, and several prescribe an exact form of deed, defining the legal effect of the specific words of conveyancing, limiting, conditioning, and so on. It follows that the laws of the States are not uniform, but the essentials of a conveyance by deed are practically the same, requiring that it be in writing, be signed and sealed by the grantors, be acknowledged before a notary or other officer authorized by the statutes, and be actually delivered. The direction which all present agitation for reform in conveyancing is taking is that pointed out by the success of the Torrens system of Australia. The main principle in that system is the registration of titles as distinguished from the registration of deeds. It was introduced first in South Australia about thirty years ago by Mr. (now Sir) Robert Torrens, was eminently successful practically, and has since been adopted by the other Australian colonies. Under it the ownership passes only on the filing, in the proper registry office, of the title; thus the actual transfer and the public notice of it are simultaneous, and the records of the office cannot be impeached by flaws in the conveyance itself, nor can a purchaser be deceived by the existence of a deed not recorded and of which he could have no knowledge. The system of registration is a very simple one; a special folio of the record is devoted to a single piece of land, and there in one place and together are recorded all transfers and transactions affecting the title of that piece of land or forming a charge on it; and, we repeat, the title to that land can shift only upon the registration itself. The Government holds to the land-owner under this system much the same relation that a corporation issuing certificates of registered stock holds to the purchaser

thereof—that is, the transfer of such stock certificates is made on the books of the company and takes effect only upon new entry therein. Under the Torrens system a 'Master of Titles' is intrusted with the duty of seeing that the transfer is regular and is properly executed. A guarantee fund is established by the State to compensate any persons injured by errors of any kind. But the percentage of claims made from the guarantee fund to the value of the property involved has been very small—less, it is said, than the one-hundredth part of one per cent. The great merit of this system is that, once established, it makes title certain and absolute, and obviates research in ancient conveyances. No doubt there is expense and difficulty in changing from the old to the new system of conveyancing, but the results attained are great. In Canada the system has been tried—though in a limited and imperfect form—in Toronto, and there is a strong agitation for its universal adoption under a compulsory law. In England a Land Transfer Reform Bill was introduced in 1875 by Lord Cairns, and passed, but in a mutilated and altogether unsatisfactory form; in 1882 a second act was passed simplifying the art of conveyancing and leading the way toward a general reform; in 1889 Lord Salisbury's Government introduced a bill making the Torrens system compulsory, which was defeated only after its third reading and by a very small majority. It seems probable that such a reform bill will pass before many years. In the State of New York an act was passed and went into effect in January, 1891, which provided for a reformed or block scheme of indexing conveyances to supplant the old system of consecutive registration of deeds indexed only by the names of the parties thereto. This is also a step in the direction of the Torrens system of registration and transfer by titles. The Torrens system has been adopted in Massachusetts, Illinois, and several other States.

Consult: Leonard A. Jones, *Forms in Conveyancing and General Forms* (5th ed., Indianapolis, 1899); Wolstenholme, *Forms and Precedents Adopted for Use Under the Conveyancing Acts* (5th ed., London, 1891); Sheppard, *The Touchstone of Common Assurances, etc.* (Amer. ed., Philadelphia, 1840-41); Greenwood, *Manual of the Practices of Conveyancing* (8th ed., London, 1891); Elphinstone, *Introduction to Conveyancing* (5th ed., London, 1900); Hunter, *The Dominion Conveyancer* (Toronto, 1893).

CONVICT (Sp., Port. *convicto*, from Lat. *convictus*, p.p. of *convincere*, to convict, from *com-*, together + *vincere*, to conquer). A person found guilty, after due trial, of a criminal offense; in general use applied only to those convicted of felony or serious crimes, not to those guilty of petty offenses. The system used by a country in dealing with convicts is termed the convict system. In Europe in the Middle Ages the punishments inflicted upon criminals were cruel and brutal. Through the influence of the Church a system of fines was established and physical punishments were modified. Later it became customary to transport convicts to colonial possessions. England transported convicts to Australia until about the middle of the nineteenth century. The year 1900 marks the practical abandonment of transportation by all civilized countries, except France, where it is a secondary

feature of the penal system. In civilized countries fines and imprisonment are the customary punishments. In Europe the prisoners are usually kept apart from each other; in America more freedom of association is allowed. For economic and moral reasons, prisoners are given steady employment. Consult: Drühms, *The Criminal: His Personnel and Environment* (New York, 1900); Lombroso, *L'uomo delinquente* (Turin, 1896). See CONVICT LABOR; PENOLOGY; PRISONS.

CONVICT LABOR. In all penitentiaries the work of keeping the institution in good order and carrying on the domestic arrangements is done by the prisoners. In addition, repairs and improvements, such as constructing new buildings, is often done by inmates under expert direction. This would not furnish sufficient employment to keep the prisoners occupied. For the sake of the convict as well as for the pecuniary returns, it is customary to employ the prisoners in productive enterprises. In America these general systems prevail.

In the lease system the convicts are leased to contractors for a fixed sum and period, the entire responsibility for the care and safe-keeping of the convicts devolving upon the contractors. This system may reduce the cost to the State, but it tends to great abuses and should be abolished. It prevails only in some of the Southern States.

The contract system exists in two forms. In the first the labor of the convicts is furnished to contractors for a fixed sum, the contractors personally directing the employment in the institution. The raw material and machinery are furnished by the contractor, though in some cases the State furnishes the latter. In the second form, the piece-price system, the contractor furnishes the material and pays a stipulated price for the finished product. The direction of the industry is in the hands of the prison officials. The advantage of this form is that it avoids the possibility of trouble coming from the presence in the institution of employers who are not directly responsible to the authorities.

The contract system has been in general use. It has many advantages. The industry is managed by experts who can buy and sell to better advantage than can the warden, who, presumably, is not so well posted. Moreover, the State is not subject to loss because of gluts in the market or because of official ignorance or duplicity. It necessitates no great investment in expensive machinery. It has furnished steady employment to the prisoners and has reduced appreciably the net cost of maintenance.

There are, however, serious objections to the plan. When it involves the presence of outside overseers it may seriously interfere with prison discipline. From an educational standpoint the highly developed industry interferes with the training of the individual convict. This applies with special force to the younger prisoners. Employers have condemned the system on the ground that the cheap labor gave the contractor an unfair advantage. Labor unions have objected because they felt that it had a tendency to lower wages. The objections have weight. While the total of prison labor is but a small part of the labor of the country, the introduction of special industries may easily depress and unfairly compete with similar local industries.

For these reasons the contract system is losing ground and is giving place to the public-account system. The State furnishes the plant and materials and conducts the entire business through its officials. Any profits go to the State, and any loss is borne by it. Products are sold upon the open market, or, as in New York, only such articles may be made as will be utilized in other public institutions, or in the various State departments. Under this system the individual prisoner may be employed as seems for his best interest. Generally speaking, this plan is probably the best yet proposed. It tends, however, to influence the warden to strive for financial success rather than for the upbuilding of character, and opens the way for financial scandals. It does not avoid competition with free labor. If the New York plan is adopted there should be a central body to regulate the industries in the different institutions, that there may not be a surfeit of certain articles and a scarcity of others.

Penologists now advocate manual and technical training, particularly for the younger men. They agree that this system, though more expensive, will in the end yield far larger returns to society than the present industries. It might be thought that the employment of convicts in public enterprises, such as road-making, would be profitable. Experience has not confirmed this view, and such employment is now considered advantageous only under peculiar local circumstances. Consult: *United States Industrial Commission Report on Prison Labor* (Washington, 1900); *Proceedings of National Prison Association* (Pittsburg, 1898, 1899); Henderson, *Introduction to Study of Dependents, Defectives, and Delinquents* (Boston, 1893). See PENOLOGY; CRIMINOLOGY.

CONVOCATION (Lat. *convocatio*, from *convocare*, to call together, from *com-*, together + *vocare*, to call, from *vox*, voice). An assembly of the clergy of the Church of England, analogous in many respects to Parliament, at the same time with which it usually meets. As a factor in the development of English institutions, it is of great interest, being in some shape perhaps older than Parliament, into which attempts were made to incorporate it in the reigns of Edward I. and Edward II. Convocation formerly exercised the right of enacting ecclesiastical legislation, and also of voting subsidies to the Crown; but the former right was greatly restricted under Henry VIII. and by later acts of Parliament, while the latter was abandoned in 1664, since which time the clergy have been taxed like other citizens. Certain convocations are of importance in the history of both Church and State in England; in particular that of 1529, which established the royal supremacy; that of 1562, which confirmed the Articles of Religion; that of 1603, which enacted an important body of canons; and that of 1661, which completed the revision of the Book of Common Prayer. About the beginning of the eighteenth century a factious spirit prevailed, so that the sittings of the Lower House were distinguished by contention with the bishops. Convocation was prorogued in 1717, and not again assembled until the revival of Church life in the nineteenth century caused a demand for the renewal of its sessions. By the influence of Bishops Wilberforce, of Oxford, and Philpotts, of Exeter, the

Convocation of Canterbury reassembled in 1852 and that of York in 1856, since which time their meetings have been regularly held. Each province has a convocation of its own. The Upper House is composed of the diocesan bishops; the Lower of bishops suffragan, deans, archdeacons, and certain representatives of the lower clergy, known as proctors; in the Province of Canterbury they are elected by the beneficed clergy alone, while in that of York all the clergy have a vote, sending one proctor for each archdeaconry. The Lower House in the southern province numbers about 160 members, in the northern about 80. While Convocation has no legislative functions nowadays, its discussions are of great interest to members of the Church of England. A 'House of Laymen' has recently been organized, which, while not constitutionally forming a part of Convocations, discusses similar topics on parallel lines. Consult: Trevor, *The Convocations of the Two Provinces: Their Origin, Constitution, and Forms of Proceeding, with a Chapter on Their Revival* (London, 1854); Lathbury, *A History of the Convocation of the Church of England to 1742* (London, 1842); Whitehead, *Church Law* (London, 1872).

In the University of Oxford, the term Convocation is applied to the assembly composed of all masters of arts, non-resident as well as resident, which finally accepts or rejects the statutes which have passed the narrower governing bodies, the Hebdomadal Council and Congregation. See OXFORD UNIVERSITY.

CONVOLVULA'CEÆ (Neo-Lat. nom. pl., from Lat. *convolutus*, bindweed, from *convolvere*, to roll together, from *com-*, together + *volvere*, to roll). An order of dicotyledonous plants, the morning-glory family. They are annuals or perennials, many are twining or climbing in habit, and one genus, *Cuscuta*, is a climbing parasite. (See DODDER.) In many the stems contain a milky juice, and some have tuberous roots which are of economic value as furnishing jalap, scammony, sweet potato (q.v.), etc. Some are noted for their beautiful flowers, as the morning-glory (q.v.). The leaves are generally alternate and without stipules. The calyx is five-parted and the corolla with a five-lobed and plaited limb which is usually valvate, sometimes convolute. The stamens are inserted within the corolla, alternating with its lobes. The ovary is free and consists of two, rarely more, carpels and bears two or more ovules. The fruit ripens into a berry, nut, or capsule. This order is closely related to the Scrophulariaceæ and Boraginaceæ (q.v.). The order is divided into Convolvuloideæ, which are green plants, the principal genera being *Dichondra*, *Evolvulus*, *Ipomœa*, *Convolvulus*, and *Erycibe*; and *Cuscuta* with *Cuscuta* as the only genus, the species of which are leafless parasites of curious habit.

CONVOLVULUS (Lat., bindweed), or BINDWEED. A genus of plants, the type of the natural order Convolvulaceæ. This genus contains nearly 150 species, herbaceous and shrubby, generally with a twining stem and milky juice; large and beautiful flowers, a five-parted calyx, a monopetalous corolla, with regular five-lobed and plaited limb. The plants of this genus are very abundant in the tropics, but comparatively rare in cold climates. Many are cultivated as orna-

mental plants, particularly species of *Convolvulus* and *Ipomœa*, the latter being commonly known as 'morning-glory.' Some species have large farinaceous roots, capable of being used as food, of which the sweet potato (q.v.), or batatas, is the most important. Two or three are common in the Eastern United States and are called bindweed. *Convolvulus arvensis* is a troublesome weed in some sandy soils near the coast, and *Convolvulus scpium* in richer soils. The former has rose-colored fragrant flowers, the latter large white flowers. Both are ornamental, the latter is now often planted to cover posts and trellises. *Convolvulus scammonia* yields scammony, and the root of *Ipomœa pandurata* is used as a purgative in the United States. *Convolvulus scoparius*, a shrubby species, native of the Canary Isles, yields one of the kinds of wood called rosewood, which has a strong smell of roses. *Ipomœa jalapa* of this order yields jalap, a well-known cathartic. It abounds in Mexico. For illustration, see Plate of DICOTYLEDONS.

CONVOY (Fr. *convoy*, from *convoyer*, to convey). The name given to one or more ships of war appointed to protect a fleet of merchant vessels against the attacks of an enemy or pirates. If a merchant ship part company with the convoy, or neglect to obey the signals, all claims of insurance are forfeited. The name is sometimes applied to the merchant vessels so escorted. In the military service, a convoy is, properly speaking, a train of wagons laden with provisions or warlike stores; the term, however, is applied also to the detachment of troops, or escort, appointed to protect such a train.

CONVULSION (Lat. *convulsio*, convulsion). A symptom of disease occurring in sudden attacks during which the patient generally loses consciousness; the muscles of a part or of much of the body are contracted and relaxed involuntarily, in spasmodic and irregular movements; the eyes are generally open, the eyeballs turned up or to one side; the teeth are set tight together; the tongue or cheeks are frequently bitten; the breathing is at first arrested, then labored and deep; the face is generally red, and the saliva cozes from the mouth as froth. In epilepsy (q.v.) the convulsions are as just described and the patient generally sleeps immediately after them before regaining consciousness. In hysteria (q.v.) there is less writhing and more rigidity, the patient is not entirely unconscious in most cases, her cheeks remain pale, and she regains consciousness after a period of confusion, without sinking into a sleep; the tongue is not bitten and froth does not issue from the mouth. Uræmic convulsions are very similar to those of epilepsy. Convulsions are also caused by irritation of the brain and spinal cord from other sources than those mentioned, such as anæmia of the brain, tumors of the brain, alcoholic intoxication, acute indigestion, Bright's disease, intestinal worms, etc., as well as certain acute diseases with an initial rise of temperature.

In all cases of convulsions, except when occurring in a mother who has just given birth or is about to give birth to a child, the clothing should be removed and the patient immersed in a hot bath up to the neck for ten or fifteen minutes or till the limbs relax. An enema of scapsuds containing twenty drops of turpentine will always be of advantage to an adult, and an

enema of water to a child. The patient should never be grasped and held by any one, but should be protected from falling from the bed with cushions and pillows. In epileptiform convulsions, the tongue should be protected from being bitten by being thrust back into the mouth, or by a rubber eraser inserted between the teeth. The patient should not be allowed to bury the nose and mouth in the pillows.

CONVULSIONARIES (Fr. *convulsionnaires*, from Lat. *convulsio*, convulsion, from *convellere*, to convulse, from *com-*, together + *vellere*, to pluck). A fanatical sect of Jansenists who sprang up in France about 1730. Their meeting-place was the churchyard of Saint Médard, in a suburb of Paris, where was the tomb of a certain Francis of Paris, who died in 1727, and was reckoned very holy by the Jansenists on account of his extravagant asceticism. At this tomb a multitude of people poured forth fanatical prayers, preachments, and prophesyings. Miracles are also alleged to have been performed, for proof of which we are referred to a work written by Carré de Montgeron, a member of the Parliament of Paris, and entitled *La vérité des miracles opérés à l'intercession de M. de Paris et autres appellans* (Paris, 1737, 3 vols.). After 1731 the fanaticism of the convulsionaries increased to utter madness. "They threw themselves into the most violent contortions of body, rolled about on the ground, imitated birds, beasts, and fishes, and at last, when they had completely spent themselves, went off in a swoon." In 1733 the King issued an order for the imprisonment of these fanatics, but it was found impossible to put a complete stop to the mischief. They took to predicting the downfall of the throne and the Church. They were not much heard of in Paris after the middle of the eighteenth century, but were met with later in country places at various times. They brought Jansenism into so much disrepute that Voltaire declared the tomb of Francis to be the grave of Jansenism. Consult P. F. Mathieu, *Histoire des miracles et des Convulsionnaires de Saint-Médard, précédée de la vie du diacre Paris, d'une notice sur Carré de Montgeron et d'un coup d'œil sur le Jansénisme* (Paris, 1864).

CONWAY. A river in North Wales, 30 miles long, noted for its scenic beauty. It rises in a small mountain lake and flows past Llanrwst Trefriw into the Irish Sea. At Conway it is half a mile broad at spring-tides, which rise here 21 to 24 feet. The Conway has been famous for its pearls since Roman times.

CONWAY, or ABERCONWAY. A seaport market town and municipal borough of Carnarvonshire, North Wales, beautifully situated on a steep slope on the left bank of the Conway, 22 miles northeast of Carnarvon (Map: Wales, C 3). It is surrounded by walls 12 feet thick, with towers and battlements. The principal streets are well-proportioned and regular, and contain several ancient houses. Conway Castle, one of the noblest castellated structures in Britain, stands on a precipice overlooking the river. It was built in 1284 by Edward I. to check the Welsh. Its walls are 12 to 15 feet thick, with eight vast towers, four of which are each surmounted by a slender turret. Population, in 1891, 3,400; in 1901, 4,700. Consult *Historical*

Sketch of Conway Castle and Its Environs (Carnarvon, 1852).

CONWAY. A town and the county-seat of Faulkner County, Ark., 30 miles north of Little Rock; on the Saint Louis, Iron Mountain and Southern Railroad (Map: Arkansas, C 2). It has an extensive cotton trade, lumber, flour, and cottonseed-oil mills, excelsior-works, etc. The town is the seat of Hendrix College (Methodist Episcopal, South), organized in 1884, and Central Baptist College for Women, opened in 1892. Conway was settled in 1871 and incorporated three years later, and is governed by a mayor, elected annually, and a council. Town meetings are held annually to select candidates for mayor. The electric-light plant is owned and operated by the municipality. Population, in 1890, 1,207; in 1900, 2,003.

CONWAY. A town in Carroll County, N. H., containing the villages of Kearsarge, North Conway, Conway, and Conway Centre, 71 miles northeast of Concord; on the Saco River and on the Boston and Maine Railroad (Map: New Hampshire, K 5). The village of North Conway is famed for beautiful scenery, and is a popular summer resort. Conway is the centre of an extensive granite industry, and has a ribbon peg factory, spool-mill, and lumber and canning interests. Population, in 1890, 2,331; in 1900, 3,154.

CONWAY, HENRY SEYMOUR (1721-95). An English field-marshal, a second son of Francis Seymour, first Lord Conway. He was aide-de-camp to the Duke of Cumberland at the battles of Fontenoy and Culloden, in 1745 and in 1746. On March 30, 1759, he was appointed lieutenant-general, and in this capacity served under the Duke of Brunswick in Germany. He persistently opposed the war with America, and on February 22, 1782, in an address to Parliament, urged the advisability of discontinuing aggressive warfare against the American Colonies. Shortly after the resignation of Lord North, he became Commander-in-Chief of the Army (March 27, 1782).

CONWAY, HUGH. The literary pseudonym of Frederick John Fergus, part of which may have been first suggested to him by his student life on the school-frigate *Conway*.

CONWAY, MONCREE DANIEL (1832—). An American clergyman, historian, and ethical writer. He was born in Stafford County, Va., March 17, 1832, and was graduated at Dickinson College (1849), and at the Harvard Divinity School (1854), having studied law and been a Methodist minister in the interval. He imbibed humanitarian and rationalistic ideas, and returned to Virginia to preach them, but was obliged to leave the State. He then took charge of a Unitarian church in Washington, D. C., but, too outspoken against slavery, was forced to go to Cincinnati, where he preached, wrote books, and edited *The Dial*. There, and later in Boston as editor of *The Commonwealth*, he urged emancipation, and in 1863 went to England to explain the cause of the war. Here he accepted a call to the ultra-liberal South Place Chapel, London, and was minister there from 1863 to 1884, doing a large amount of varied literary work. At the close of the last century he returned to America and resided in New York City. He subsequently began the writing of his reminiscences. Among his volumes are: *The Rejected Stone* (1861); *Idols and Ideals* (1877); *Demonology and Devil*

Lore (1878); *The Wandering Jew* (1881); as well as biographies of *Edmund Randolph* (1888), *Thomas Carlyle* (1881), *Emerson at Home and Abroad* (1882), and *Hawthorne* (1890). His edition of the writings of Thomas Paine (4 vols., 1894-96) and his life of Paine (2 vols., 1892) are his most important works.

CONWAY, ROBERT SEYMOUR (1864—). An English classical philologist. He was born at Stoke Newington, September 20, 1864. He received from Gonville and Caius College, Cambridge, the degrees of B.A. (1887); M.A. (1891); Litt.D. (1898). He was made fellow of Gonville and Caius (1888-91); classical lecturer in Newnham College (1887-93); professor of Latin, University College, Cardiff, Wales (1893—). He is the author of *Verneri's Law in Italy* (1887); collaborator in the translation of *Brugmann's Comparative Grammar* (1888-95); and the editor of *The Italian Dialects* (Cambridge, 1897), etc.

CONWAY, THOMAS (1733-c.1800). An Irish soldier of fortune, who became an officer on the American side in the Revolutionary War. He was educated in France, entered the French army, and had attained the rank of colonel when, early in 1777, he came to America and offered his services to Congress. He was appointed a brigadier-general in May of this year, served at Brandywine and Germantown, and later in the year was made inspector-general, with the rank of major-general, contrary to Washington's wishes. He was the chief conspirator in the 'Conway Cabal' (q.v.), and upon the discovery of his intrigue resigned from the army in 1778. Soon afterwards, on July 22, he was wounded in a duel by General Cadwallader, who challenged him because of his attacks upon Washington. Conway then returned to France, reentered the army, and in 1784 was appointed Governor of Pondicherry and the French settlements in Hindustan. In 1792 he was appointed commander of the royalist forces in the south of France, but on the success of the Revolutionists fled from the country.

CONWAY, SIR WILLIAM MARTIN (1856—). An English author and explorer. He was born at Rochester, was graduated M.A. at Trinity College, and remained at Cambridge till 1880; lectured on art in university extension courses, and was appointed first professor of art at University College, Liverpool (1884). Subsequently he traveled extensively, surveying the Himalayas (1892), traversing the Alps (1894), exploring the interior of Spitzbergen (1896-97), and the Bolivian Andes (1898). Among his numerous works on art and exploration are *Woodcutters of the Netherlands in the Fifteenth Century* (1884); *Literary Remains of Albrecht Dürer* (1889); *Climbing and Exploration of the Karakoram-Himalayas* (1894); *The Alps from End to End* (1895); *The First Crossing of Spitzbergen* (1897); *Climbing and Exploration in the Bolivian Andes* (1900). He was knighted in 1895.

CONWAY CABAL', THE. In American history, the name given to an intrigue, organized under the leadership of Thomas Conway (q.v.), in 1777, during the Revolutionary War, for the purpose of bringing about the supersession of Washington, as Commander-in-Chief of the American armies, by General Horatio Gates. With Conway were associated such men as Gates, Charles Lee, Thomas Mifflin, and Benjamin Rush,

besides several other army officers and members of the Continental Congress, who charged Washington with gross incompetence and favoritism, and in particular endeavored to prove the superiority of Gates over Washington as a commander by contrasting the victories of the former at Saratoga with the almost contemporaneous reverses of the latter at Brandywine and Germantown. The faction gained sufficient power to secure the appointment of Gates as head and of Thomas Mifflin as a member of the Board of War and the promotion, against Washington's emphatic advice, of Conway to the rank of major-general, and to the position of inspector-general; but they did not succeed in retaining any considerable following, and in a few months their schemes fell through, and Conway was virtually forced to leave the service (1778). A good account of the intrigue is given in vol. ii. of Fiske's *The American Revolution* (Boston, 1893).

CONWELL, RUSSELL HERMAN (1842—). An American Baptist clergyman. He was born at Worthington, Mass., and was educated at Wilbraham Academy, and at Yale and Albany colleges. During the Civil War he served in the Union Army (1862-65), and rose to the rank of lieutenant-colonel. After the war he devoted himself to the practice of law. He was correspondent in Germany of the *New York Tribune* and the *Boston Traveller* from 1868 to 1870. After his ordination to the ministry in 1879 he occupied the pulpit of Grace Baptist Church, Philadelphia (1881-91). He founded and became president of Temple College (established 1888), and the Samaritan Hospital was also established by him (1890). In 1891 he became pastor of the Baptist Temple, in Philadelphia. The following are his principal works: *Why the Chinese Emigrate; Woman and the Law; Joshua Gianavello; Acres of Diamonds; Lives of the Presidents*; and special biographies of Bayard Taylor, Charles H. Spurgeon, and Presidents Hayes and Garfield.

CONYBEARE, KŪN'Ī-BĀR, JOHN (1692-1755). An English clergyman. He was born at Pinhoe, graduated at Oxford, and was ordained priest in 1716. In 1730 he was chosen master of Exeter College, of which he had previously been a tutor. Before this time he had attracted notice by the publication of two sermons on *Miracles* (1722), and on the *Mysteries of the Christian Religion* (1724). In 1732 he published his great work, *A Defense of Revealed Religion*, a reply to Matthew Tindal's *Christianity as Old as the Creation* (1730). Conybeare was appointed Dean of Christ Church, Oxford, and finally Bishop of Bristol (1750).

CONYBEARE, JOHN JOSIAS (1779-1824). An English scholar. He was the grandson of the Bishop of Bristol, and became professor of the Anglo-Saxon language (1807) and of poetry at Oxford (1812). He made some contributions to the literature of geology and chemistry, but is chiefly remembered for his devotion to Anglo-Saxon literature. His *Illustrations of Anglo-Saxon Poetry* (1826) was edited by his brother, William Daniel Conybeare.

CONYBEARE, WILLIAM DANIEL (1787-1857). An English geologist and clergyman, the younger brother of John Josias Conybeare. He was educated at Westminster and Oxford. While at the latter institution he devoted much time to the study of geology, and his researches

in this science afterwards procured for him the friendship of Buckland, De la Bêche, Elie de Beaumont, and many of the leading geologists of the time. He contributed several papers on various geological subjects to English periodicals and was admitted to membership in the Royal Society and the Geological Society of London. In 1844 he became Dean of Llandaff, an office he retained until his death in 1857.

CONYBEARE, WILLIAM JOHN (1815-57). An English clergyman and essayist, the son of Rev. William Daniel Conybeare (q.v.). He graduated at Cambridge in 1837, took orders four years later, and in 1848 succeeded his father as vicar of Axminster. He wrote *Perversion; or, the Causes and Consequences of Infidelity*, a religious novel (1856); and *Essays Ecclesiastical and Social* (1856). He is best known, however, as joint author, with Rev. J. S. Howson, of the *Life and Epistles of Saint Paul* (1851).

CONYERS, kōn'yērz. A town and the county-seat of Rockdale County, Ga., 30 miles east-southeast of Atlanta; on the Georgia Railroad (Map: Georgia, B 2). It is in a cotton-growing and granite-quarrying country. Population, in 1890, 1349; in 1900, 1605.

CONZE, kōn'tse, ALEXANDER (1831—). A German archaeologist. He was born at Hanover, and was educated at Göttingen and Berlin. He was professor of archaeology at Halle (1863-69), Vienna (1869-77), and Berlin (1877-87). He was also director of the Berlin Museum, and in 1887 received an appointment as general secretary of the German Archaeological Institute. His writings include chiefly, in addition to some general studies, the following descriptions of travel and excavations: *Reise auf den Inseln des thrazischen Meeres* (1860); *Archäologische Untersuchungen in Samothrace* (2 vols., Vienna, 1875-80); *Beiträge zur Geschichte der griechischen Plastik* (2d ed., Halle, 1869); *Die Ergebnisse der Ausgrabungen von Pergamon* (Reports 1-3, Berlin, 1880-88).

COO'DIES, THE. A name applied to the New York Federalists who favored the War of 1812. It was derived from Abimalech Coody, the pseudonym adopted, in his communications to the press, by Gulian C. Verplanck, the leader of the faction. Consult Hammond, *The History of Political Parties in the State of New York* (4th ed., Coopers-town, 1846).

COOK, MOUNT (called by the Maoris *Ahoarangi*, cloud-breaker). A mountain in the Southern Alps, on the South Island, New Zealand. (Map: New Zealand, C 5). It has an altitude of 12,350 feet, and is regarded as the highest point of Australasia. Its top is covered with perpetual snow. The first ascent was made in 1882. Since then the mountain has been repeatedly ascended and explored.

COOK, ALBERT STANBUROUGH (1853—). An American scholar, born at Montville, N. J. He graduated in 1872 at Rutgers College, studied at the universities of Göttingen and Leipzig, and in 1879-81 was associate professor of English at the Johns Hopkins University. In 1882 he was appointed professor of English at the University of California, where he thoroughly reorganized the department, and through it indirectly influenced the instruction in English in the entire State. In 1889 he was called to the chair of English language and literature at Yale Uni-

versity. He became an editor of the *Journal of Germanic Philology*, and has published a valuable translation of Sievers' *Old English Grammar* (Boston, 1885), at once most favorably received and adopted as standard in the majority of the universities of the English-speaking world. His publications further include: *The Phonological Investigation of Old English* (1888); *The Bible and English Prose Style* (1892); *The Art of Poetry* (1892); *The Artistic Ordering of Life* (1898); and editions of Leigh Hunt's *What Is Poetry?* (1893); of books i. and ii. of *Paradise Lost* (1896); and of the *Christ of Cynewulf* (1900).

COOK, CHARLES (1787-1858). An English Wesleyan clergyman, born in London. He was appointed in 1818 to the French mission of the Methodist Church in Normandy, and it was mainly by his exertions that Methodism was established in France. He engaged in a controversy with César Malan on predestination, which led to his work *L'amour de Dieu pour tous les hommes*. Consult Cook, *Life of Charles Cook* (Paris, 1862).

COOK, CLARENCE CHATHAM (1828-1900). An American art critic and author, born in Dorchester, Mass. He graduated at Harvard in 1849, studied architecture, and spent several years in teaching. He was a contributor of articles on American art to the *New York Tribune*, from 1863 until 1869, when he was appointed Paris correspondent for the same paper, and took up his residence abroad. He remained in Paris until the outbreak of the Franco-Prussian War, when he returned to New York and resumed his former relations with the *Tribune*. Cook was one of the first American art critics, and on that subject, as well as archaeology, was an accepted authority. Besides his chief work, *The House Beautiful* (1878), he wrote *Central Park* (1869), and edited a translation of Lübke's *History of Art* (1878). From 1884 he edited *The Studio* for a number of years.

COOK, EDWARD DUTTON (1829-83). An English author and dramatic critic. He studied painting and engraving; with Leopold Lewis wrote a melodrama, *The Dove and the Serpent*, in 1867-75 was dramatic critic of the *Pall Mall Gazette*, and from 1875 of the *World*. Of his works in fiction, the best known is *The Trials of the Tredgolds* (1864).

COOK, ELIZA (1818-89). An English poet, born in London. Her first volume, entitled *Lays of a Wild Harp*, she published in 1835, and, after writing considerably for periodicals, particularly the *Weekly Dispatch*, she published *Uclala and Other Poems* (1838). In 1849-54 she edited *Eliza Cook's Journal*, much of whose contents was republished in *Jottings from My Journal* (1860). In *New Echoes and Other Poems* (1864), she was not so successful as in previous works. Her unpretentious verse, including, notably, "God Speed the Plough," "The Old Armchair," and "The Star of Glengarry," has been very popular among a wide circle of readers in both England and America. A complete edition of her poetical works appeared in the "Chandos Classics Series" (London, 1870); and they were also published in New York (1882).

COOK, FRANCIS AMES (1843—). A United States naval officer. He was born in Massachusetts, and in 1863 graduated at the United States

Naval Academy. He then served for two years as an ensign in the western Gulf blockading squadron, attained the rank of commander in 1881, was in charge of the department of seamanship at Annapolis until 1883, and was inspector of ordnance at the Boston Navy-yard from 1889 to 1893. He was subsequently assistant to Rear-Admiral Ramsay, chief of the Bureau of Navigation in Washington, and in 1896, with the rank of captain, took command of the cruiser *Brooklyn*. At the beginning of the war with Spain (1898), he joined the 'flying squadron' under Commodore Schley, and took a prominent part in the battle of Santiago (q.v.), pursuing the *Cristóbal Colon* until she ran ashore at Río Tarquino, when he went aboard to receive the surrender of her commander, Captain Moren. At the close of the war he was relieved of sea duty, at his own request, and was appointed to the United States Naval Examining Board.

COOK, FREDERICK ALBERT (1865—). An American physician and explorer, born at Callicoon Depot, N. Y. He graduated at New York University in 1890, was surgeon of the Peary Arctic expedition of 1891-92, and of the Belgian Antarctic expedition of 1897-99. In addition to numerous magazine articles, he has published *Through the First Antarctic Night* (1900).

COOK, GEORGE HAMMELL (1818-89). An American geologist, born at Hanover (Morris County), N. J. He graduated in 1839 at the Rensselaer Polytechnic Institute (Troy, N. Y.), was a professor there in 1842-46, and in 1853 became professor of chemistry and the natural sciences at Rutgers College. His chair was changed to that of chemistry, natural history, and agriculture in 1867, analytical chemistry, geology, and agriculture in 1878, and geology and agriculture in 1880. In 1864 he was appointed State Geologist of New Jersey, and in 1880 director of the New Jersey Agricultural Experiment Station (Somerville, Somerset County). In addition to annual reports and many papers in scientific periodicals, he published a *Geology of New Jersey* (1868).

COOK, Captain JAMES (1728-79). A celebrated English navigator. He was the son of a farm laborer; was born at Marton, Yorkshire; was meagrely educated at the village school, and, at twelve years of age, was apprenticed to a small shopkeeper in the fishing village of Staithes. Disagreeing with his employer, he applied to a firm of Whitby ship-owners engaged in the Newcastle, Norway, and Baltic trades, and in their service soon rose to the rank of mate. In 1755, at the outbreak of the French war, he volunteered for the Royal Navy. Showing ability, in 1759 he was given a master's warrant, and, in command of the *Mercury*, proceeded to the North American station. During a winter at Halifax he diligently applied himself to the study of mathematics and astronomical navigation. The charts and observations which he made of the coasts of Newfoundland and Labrador, published in 1776-78 and distinguished for their accuracy even to the present day, introduced him to the notice of the Royal Society, and this society intrusted him with the command of an expedition to the Pacific, to observe the transit of Venus. He left Plymouth on August 26, 1768, and, after touching at Madeira and Rio Janeiro, doubled Cape Horn and reached Tahiti on April 13, 1769,

where the transit was successfully observed, June 3. On the return voyage six months were spent in sailing around and charting the coast of New Zealand, which had not been visited by Europeans for more than a century. In a similar way the eastern coast of Australia was examined and named New South Wales. The entire separation of Australia from New Guinea was determined. After a two months' stay at Batavia, he returned by the Cape of Good Hope, and arrived in England, June 12, 1771. The important geographical results of this successful voyage won universal recognition, and two months afterwards Cook received the rank of commander and an appointment to organize a new expedition for the discovery of the imaginary *Terra Australis Incognita*. He sailed with two ships from Plymouth, July 13, 1772, and in a three years' cruise of over 20,000 leagues, encircled the Antarctic region from New Zealand to Cape Horn. This voyage proved the non-existence of any very great southern continent, and established the map of the region, with the exception of details, essentially as it exists to-day. He returned to England, July 30, 1775. Taught a lesson by a mortality of 46 per cent. in his first voyage around the world, Cook had made such excellent hygienic arrangements that only one man out of 118 died during the cruise. His detailed account of the measures and precautions adopted were read before the Royal Society, which granted him the Copley Gold Medal for his important services to humanity and to the maritime world. Promoted to the rank of captain, he received an appointment at Greenwich Hospital, but shortly afterwards he offered to command an expedition in search of a passage round North America from the Pacific. He sailed July 12, 1776, by way of the Cape of Good Hope, and spent the following year in the South Pacific. Thence he set sail for the north in January, 1778, and, after rediscovering the Sandwich Islands, reached America, and added to geographical knowledge by making an almost continuous running survey of the coast as far as Bering Strait, where, stopped by impenetrable ice, he returned to winter at the Sandwich Islands. In an endeavor to recover a stolen boat he was killed by savages at Hawaii, February 14, 1779. His death occasioned widespread regret, and the King pensioned his wife and children. An obelisk erected in 1874 marks the spot where he fell. A practical and scientific seaman, a sagacious commander, kind but strict with his crew, Cook was also distinguished by indomitable perseverance and decision. An account of Cook's first voyage appeared originally as part of Hawkesworth's *Voyages* (1773); the narrative of the second was written by Cook himself, under the title of *A Voyage Towards the South Pole and Round the World, Performed in His Majesty's Ships the Resolution and Adventure, in the years 1772, 1773, 1774, and 1775* (1777); the story of Cook's third voyage, partly written by Cook himself and partly by Captain James King, appeared in 1784. Consult: Wharton, *Captain Cook's Journal During His First Voyage Round the World* (London, 1897); Syngé, *Captain Cook's Voyages Round the World* (London, 1897); Besant, *Captain Cook* (London, 1890); Kippis, *Life of Captain James Cook* (London, 1788); *Narrative of the Voyages Round the World Performed by Captain James Cook* (2 vols., London,

1878); Russell, *Chart of the World*, *Showing the Track and Discoveries of Captain Cook* (London, 1799).

COOK, JOSEPH (1838-1901). An American lecturer and author, born at Ticonderoga, N. Y. He studied at Phillips Academy and at Yale, and graduated at Harvard in 1865. He then spent three years at Andover Theological Seminary; preached in various Congregational churches; spent two more years in study in Germany, and then settled in Boston, where in 1874 he began his 'Boston Monday Lectures,' which became very popular and which he continued until 1880, when he set out on a two years' lecturing journey round the world. In 1883 he resumed his Monday Lectures in Boston. In 1888 he founded a religious monthly called *Our Day*. He lectured on many subjects, both in Europe and in America, and had great vogue with a part of the religious public for the reason that all of his philosophical discourses were attempts to harmonize religion and science. He published: *Monday Lectures* (11 vols., 1876-88); *The Higher Levels of Arbitration* (1900); and *New Defences of the Lord's Day* (1900).

COOK, THOMAS (1808-92). An English railway excursion and tourist pioneer, born at Melbourn, Derbyshire. His energy was at first devoted to the cause of temperance, but later to the work with which his name is now inseparably connected. Beginning in 1841 with trips between Leicester and Loughborough, on the Midland Railway, the business rapidly increased in spite of many difficulties. The tourist tickets of Thomas Cook & Son have now become known all over the world. See **COOK'S EXCURSIONS**.

COOKE, GEORGE FREDERICK (1756-1811). An English tragedian, born at Westminster. He made his debut on the stage in 1776, and soon became very popular in England and Ireland. In 1810 he appeared in New York and other American cities, where his success was equally great. Although possessed of fine talents, Cooke ruined his career by intemperance, which also caused his death. His best work was in the characters of Shylock, Iago, and Richard III. Edmund Kean, who admired him as the greatest of actors, erected a monument to his memory in Saint Paul's Churchyard, New York City. Consult Dunlap, *Memoirs of Cooke* (London, 1813).

COOKE, GEORGE WILLIS (1848—). An American clergyman, editor, and author, born at Comstock, Mich. He studied at Olivet College (Mich.) and at the Meadville Theological School (Pa.); was in 1872 ordained to the Unitarian ministry, and until his retirement in 1899 held pastorates at Grand Haven, Mich.; Indianapolis, Ind.; Dedham, Mass.; Lexington, Mass.; and Dublin, N. H. In 1897 he became an editor of *The Christian Register*, and in 1900 of the *Boston Evening Transcript*. He has lectured at the Concord School of Philosophy and has published such useful critical works as *Ralph Waldo Emerson: His Life, Writings, and Philosophy* (1881); *George Eliot: A Critical Study of Her Life, Writings, and Philosophy* (1883); and *A Guide-Book to the Poetic and Dramatic Works of Robert Browning* (1891).

COOKE, HENRY (1788-1868). An Irish Presbyterian leader. He was born at Grillagh, near Maghera, County Derry, May 11, 1788; studied at Glasgow and Dublin; entered the ministry in

1808, and from 1829 was pastor in Belfast, and from 1847 professor of sacred rhetoric in Queen's College there. He played a prominent part in his denomination's affairs and was especially active and successful in combating Arianism in the Irish Presbyterian Church, and in promoting educational movements. He was an orator of a high grade, but he left no publications other than speeches and sermons. For a half-century his life was a large portion of the religious and public history of Ireland. A statue of him was erected in Belfast in 1875. For his life, consult J. L. Porter (3d ed., Belfast, 1875).

COOKE, JAY (1821-1905). An American banker and financier, born in Sandusky, Ohio, the son of Eleutheros Cooke, a pioneer Ohio lawyer and member of Congress. He was privately educated, and in 1838, entered the banking house of E. W. Clark & Co., in Philadelphia, where he developed such rare ability in banking and financial matters that he was made a junior member of the firm in 1842. In 1858 he retired from the firm, and until 1861 was engaged in financing railroad companies and negotiating their bond issues. In the latter year he established the banking house of Jay Cooke & Co., in Philadelphia. During the Civil War, as the principal financial agent of the Federal Government, he performed services of inestimable value to the nation. He negotiated the first five-twenty loan of \$513,000,000, the ten-forty loan of \$200,000,000, the seventy loan of \$830,000,000, and others, making a total of over \$2,000,000,000. He was an ardent advocate of the national banking system, and was influential in securing its success at the start. The failure of his banking house in 1873, through having advanced too largely on Northern Pacific Railroad bonds, was one of the causes of the financial crisis in that year; but the principal and interest was eventually paid on all claims, and the firm continued successfully.

COOKE, JOHN ESTEN (1830-86). An American novelist. He was born at Winchester, Va., the son of a distinguished lawyer, John Rogers Cooke, and brother of Philip Pendleton Cooke (q.v.). He studied law, but showed early a literary bent, and published several books before he was twenty-five. Among these was his best work, *The Virginia Comedians* (1854), a Colonial romance uneven in merit, yet full of a promise not destined to be realized, on account in part of the strenuous experiences its author underwent during and after the Civil War. He entered the Confederate service on Stonewall Jackson's staff, and on the death of the latter was transferred to the staff of Gen. J. E. B. Stuart. Later he was inspector-general of the horse artillery of the Army of Northern Virginia. From the close of the war until his death his pen was rarely idle. Novels dealing with military events in Virginia and biographies of the great generals under whom he had served were produced with a speed fatal to high literary art, but they did not prevent his work having distinct literary and historical value as representing the thoughts, feelings, and experiences of an active participant in the stirring events of the war and reconstruction periods. The most popular of his military novels is *Surry of Eagle's Nest* (1866), which is understood to be partly autobiographical. A complete list of his publications is not necessary, but the following may be mentioned as important: *Leather Stocking and Silk* (1854); *The*

Youth of Jefferson (1854); *Ellie, or the Human Comedy* (1855); *Henry Saint John, Gentleman* (1859), a sequel to *Virginia Comedians*; *Wearing of the Gray* (1867) and its sequel, *Mohun*; *or, the Last Days of Lee and His Paladins* (1868); *Life of Stonewall Jackson* (1863, 1876); *Life of R. E. Lee* (1871); and *Virginia: A History of the People* (1883), an excellent book contributed to the "American Commonwealths Series."

COOKE, JOSIAH PARSONS (1827-94). An American chemist, born in Boston. He graduated at Harvard in 1841, and soon afterwards was appointed to the chair of chemistry and mineralogy at Harvard College. In this capacity he stimulated the scientific study of chemistry at collegiate institutions, urging laboratory instruction, which, before his time, had not been introduced into the undergraduate course of American colleges. His publications include *Chemical Problems and Reactions* (1853); *The New Chemistry* (1871); *Religion and Chemistry* (1864); and *The Credentials of Science the Warrant of Faith* (1888).

COOKE, MORDECAI CUBITT (1825-). An English botanist, born at Horning, in Norfolk. When a boy he was apprenticed in the draper's trade, afterwards acted as clerk in a law office, and subsequently taught school. At the age of thirty-five he obtained a position in the India Museum, from which he was transferred to the Kew Botanical Gardens in 1880. His publications include more than forty botanical works, for the most part dealing with fungi, and including *Manual of Botanic Terms* (1862); *A Fern Book for Everybody* (1867); *Handbook of British Fungi* (1874); *Mycographia* (6 vols., 1879); *Illustrations of British Fungi* (8 vols., 1881); *An Introduction to the Study of Fungi* (1895).

COOKE, PHILIP PENDLETON (1816-50). An American poet, elder brother of John Estlin Cooke and first cousin of John Pendleton Kennedy, the novelist. He was born at Martinsburg, Va. He graduated at Princeton in 1834, and, like his more famous younger brother, studied law under his father, but preferred literary pursuits, and contributed many poems and stories to the *Southern Literary Messenger* and other magazines. He was equally devoted to field sports, which in part accounts for the fresh quality of his work, especially of his *Froissart Ballads* (1847), his only published book. In spite of a lyrical talent which once gained the commendation of Lowell, Cooke is little known save for his sweet lyric of sentiment "Florence Vane," which was popular and has been frequently translated.

COOKE, PHILIP SAINT GEORGE (1809-95). An American soldier, born near Leesburg, Va. He graduated at West Point and was assigned as second lieutenant of the Sixth Infantry in 1827, served for many years on the frontier, participated in the Black Hawk War of 1832, and became lieutenant of dragoons in 1833. During the Mexican War he served from October, 1846, to July, 1849, in California as lieutenant-colonel of a battalion of Missouri volunteers, and for a short time commanded a regiment in the City of Mexico. In 1847 he became major of the Second Dragoons. After 1849 he was reassigned to frontier duty, took part in several operations against the Indians, commanded the cavalry in

the Utah Expedition of 1857-58, became colonel of the Second Dragoons in 1858, and from August, 1860, to August, 1861, was in command of the Department of Utah. He was raised to the rank of brigadier-general in November, 1861, and participated as a commander of a cavalry division in the Peninsular Campaign, commanded the Baton Rouge District of the Department of the Gulf from October, 1863, to May, 1864, and from May, 1864, to March, 1866, was general superintendent of the recruiting service. At the close of the war he was brevetted major-general for 'gallant and meritorious services.' He commanded the Department of the Platte in 1866-67, the Department of the Cumberland in 1869-70, and the Department of the Lakes from 1870 until his retirement in 1873. He published *Scenes and Adventures in the Army, or Romance of Military Life* (1856); *The Conquest of New Mexico and California: An Historical and Personal Narrative* (1878); and *New Cavalry Tactics* (1884).

COOKE, ROSE TERRY (1827-92). An American poet and writer of short stories, chiefly of New England rural life, whose prominent characteristics are pathos and humor. She was born at West Hartford, Conn., and was educated at the Hartford Female Seminary. She lived chiefly at Collinsville till her marriage to R. H. Cooke in 1873, after which she lived at Winsted, Conn., till 1887, removing thence to Pittsfield, Mass., where she died in 1892. Her first published work was *Poems* (1860), which won cordial recognition. A second and complete collection of her verses was made under the same title in 1888, but the earlier pieces remain the best. Her genial talent then turned to fiction, often defective in form, but spontaneous, fresh in its humor, and keen in its perception of New England traits and character. Her volumes, except for a single novel, *Steadfast* (1889), are collections of short stories: *Happy Dodd* (1879); *Somebody's Neighbors* (1881); *Root-Bound* (1885); *The Sphinx's Children* (1886); *Huckleberries* (1891). Of individual stories she is said to have regarded *The Deacon's Week* as best. It was translated into four languages and had a very wide circulation. Others deserving of special commendation are: *Polly Mariner*; *Old Miss Dodd*; and *Freedom Wheeler's Controversy with Providence*.

COOKE, THOMAS (1703-56). An English writer, known as Hesiod Cooke. In 1725 he published a poem called *The Battle of the Poets*, in which he attacked Pope and the other wits, and was rewarded by a place in the *Dunciad* (ii. 138). He did a large amount of miscellaneous literary work and was for a time editor of the *Craftsman*. He has a deserved place in literature as the translator of Hesiod (1728) and of Terence (1734).

COOKE, SIR WILLIAM FOTHERGILL (1806-79). An English electrical engineer, born at Ealing, in Middlesex. He received his education at Durham and Edinburgh, served on the Indian staff from 1826 to 1831, and then studied medicine and the physical sciences in France and in Germany. In 1837 he entered into partnership with Wheatstone, and together with him rendered services of the highest importance to electrical engineering, especially to telegraphy. In 1838 he built the first English telegraph line, between

London and West Drayton. He was knighted in 1869.

COOKERY. The art of preparing food for the table. Foods are cooked by the application of heat, and according to the manner in which the heat is applied the principal processes of cooking are termed boiling, stewing, steaming, braising, baking, roasting (grilling or broiling), frying, and sautéing. The effect of proper cooking is to render food more wholesome and palatable than it can possibly be in the raw state.

HISTORY. Cooking, in one form or another, has been practiced since immemorial times, and the knowledge we possess of the ancient modes of cooking presents some interest in connection with the study of the customs and habits of the past. The Egyptians, it is said, were great bread-eaters. Though they possessed wheaten flour of the finest sort, they do not appear to have used it for their common bread, which was made of spelt, or of the centre of the lotus dried and pounded. Fish they salted and dried in the sun; quails, ducks, and small birds they salted and ate raw. We read of their roasting and boiling the flesh of the ox. There appears to have been considerable difference as to the manner in which good eating was appreciated in different parts of Greece. After the Homeric age of simplicity, in which roast and boiled meats seem to have sufficed the kingly table, a diversity of preparation was attained in cooking, and a certain epicureanism displayed in the quality, seasoning, and method of dressing food. The names of many authors of cookery-books are preserved in the writings of Athenæus, that of Archestratus, who is called the guide of Epicurus in his pleasures, and styled 'the inventor of made dishes,' being the most renowned.

Fish was a principal article of food with all classes of Greeks; but with the wealthier much skill and delicacy were used in cooking it, and choice and expensive varieties were sought after. Archestratus writes of "a boiled torpedo done in oil and wine, and fragrant herbs, and some thin grated cheese" (*au gratin*). Fish, stuffed with force-meat and fried, boiled in pickle, baked in fig-leaves soaked in oil, cooked in hot ashes, etc., are among the recipes that we find recorded. The Greeks boiled and roasted the flesh of sheep, pigs, lambs, and goats. They had poultry, small birds, and game, and sausage made of blood, partaking of the character of black puddings (*Blutwurst*). The bread of Athens was the most celebrated in Greece; it was sometimes home-made, but chiefly bought in the market, and prepared in great variety, as pan-loaves, rolls, sweet loaves, etc. The bread eaten by the poorer classes was made of barley, and was sometimes flavored with oil, honey, poppy-seed, etc. Athenian cheese cakes were also famous; and there were honey and sesame cakes, which, with fresh and dried fruits, as figs, almonds, olives, and nuts, seem to have been partaken of after dinner. They consumed vegetable food also in abundance, and had cabbage, onions, lettuce, and so on.

In the Greek house there was no regular cook, though in the establishments of the wealthy several women were kept to attend to the kitchen. The women in general saw to the requirements of the table, and even the mistress of the house was not idle. Cooks stood in the market in Athens, ready to be hired for particular occasions; the

most celebrated were those of Sicily; they were probably persons of some importance.

In the early days of Rome a gruel made of lentils, and called *puls*, was the principal food of the people, and with green and other vegetables was, till later times, the usual fare of the inferior classes—meat being used but sparingly. By degrees, however, a taste for better eating crept in; and after the Asiatic conquests luxury was imported. Lucullus introduced habits of epicureanism after his return from Asia; the gourmand Apicius earned for himself an enduring name. The wealthy Romans were fond of elegant service at their tables, and studied carefully the quality of the viands that were placed before them. With them, as with the Greeks, fish was a necessary as well as a luxury; they took much trouble to procure their oysters, and gave large sums for other fish. We read of a mullet of six pounds sold for 8000 sesterces (some \$400), and of the rhombus or turbot from Ravenna being held in high estimation. They seem to have been as clever as the French in preparing surprises, and in carrying out disguises in their dishes. The *pistor*, who made the bread and pastry, and the *structor*, who built up artificial figures of fruit or flesh, and who also arranged the dishes, seem to have shared the duties of the cook. We read of dainties, as ring-doves and fieldfares, hares, capons, ducks, peacocks, pheasants, and the livers of geese; also of such a formidable *pièce de résistance* as a "huge boar, surrounded with sucking pigs made in sweet paste, which were distributed among the guests." The Romans prepared and cooked their food with oil to a great extent. Their meals probably consisted of two courses and a dessert, the first course being intended to excite an appetite; the second was a joint, roasted or baked. It was a saying of Varro's that the number of persons at a repast should not be less than that of the Graces (three) nor more than that of the Muses (nine). The Greeks and Romans used honey for the purposes for which we use sugar. Cane-sugar probably was cultivated in China, and its manufacture understood there; but the Greeks took it for a kind of concrete honey, and used it only for medicinal purposes.

Of ancient British cooking nothing is known; it was probably of an extremely rude description. Hares, poultry, and fish are said to have been forbidden as food. We do not find much mention of the art of cooking in the Saxon chronicles. The Danes and Germans appear to have been great drinkers, and to have paid little attention to the preparation of their eatables. The Normans were more curious in these matters; some offices among them were held in right of the kitchen. In early English cooking much use was made of the mortar. Oil and lard were used instead of butter. Several English cook-books bear an early date, as *The Forme of Cury*, by Pegge (1390), and others date as follows: Sir J. Elliott's book (1539); Abraham Veale's (1575); and *The Widdowe's Treasure* (1625).

The cooking of France was probably of an imperfect and rude kind until the introduction of Italian tastes by the princesses of the House of the Medici. The ancient use of oil was modified through the discovery made by the French of dressing meat in its own gravy. In our own day it is universally admitted that the French cook is a true *gastronomie* artist. We may, if we

please, impute the trouble he takes with the dressing of his meat to the inferiority of the material, but this can be said of meat only; the preparation of vegetables and fruits is attended to with equal care. The great difference between French and English or American cooking consists in the fact that the French cook their meat much longer, knowing that this renders it more digestible. They are thereby enabled to multiply dishes by altering or annihilating the original taste of the meat, and making it a vehicle for foreign flavors. The variety, daintiness, and grace of form which dishes thus acquire are very admirable. In the point of economy, the French have a decided superiority over Anglo-Saxons. The French cook throws nothing away. Instead of going to the butcher for meat for stock, as the American cook does, he uses the trimmings for stock and glaze, and the skimmings of his boiled meats in many combinations wherein we use butter or lard; and like every skilled workman, he produces great results from small means.

The estimation in which the services of a cook are held may be known by the large salary attached to the office in wealthy families, hotels, and club-houses. A visit to the kitchens of one of these establishments will show what a highly important post is that of *chef de cuisine*. There must be in such a person not only the necessary knowledge of how things are to be done, but the power to arrange and direct the work of the numerous assistants, as to the exact part which each must fulfill at every moment of the long and busy day. These places indeed are excellent schools for cooks, where they can undergo that severe training without which a thorough practical knowledge of the art cannot be attained.

The art of cooking as a branch of woman's education has latterly engaged considerable attention in America; and there are in New York, Boston, Philadelphia, and other places establishments where young women receive this kind of instruction. A school of cookery has been attached to the South Kensington Museum in London, England. Efforts are also made to teach cooking to the humbler classes of girls, but much in this respect remains to be done. For any shortcomings in cooking, however, the taste of the American is in some measure accountable.

BOILING. The use of the term 'boiling' in connection with cooking meat in water is rather unfortunate, for the operation thus designated, if properly carried out, should involve hardly any boiling. The coloring matter of the blood is changed, the fibre softened, and the connective dissolved at a temperature far below the normal boiling-point of water. Boiling over-coagulates the proteids, dissolves the mineral salts, and renders the meat less valuable as a food. This is best shown in a hard-boiled egg, in comparison with one cooked below the boiling-point. In the former the albumin is rendered hard, dense, and indigestible; in the latter the albumin is soft and creamy, and is even more easily digested than when raw. While the effect of over-boiling on meat is not so apparent as in the case of an egg, the results are precisely the same. In the case of meat, however, some boiling in the beginning of the operation is necessary. As the juices of meat are rich in albumin, it is necessary to cover the meat with boiling unsalted water, boil rapidly for five minutes to coagulate the albumin on the surface, and inclose the meat

in a water-proof casing. This will prevent the escape of the juices from the interior. But after this first hard boil the kettle should be placed over a moderate fire, where the water will simmer at 180° F., twenty minutes being allowed for each pound of meat. Seasoning may be added when the meat is partly cooked, salt having the effect of drawing the juices from raw meat. These rules apply to the flesh of fish and fowl. The flesh of fish, however, is found to be firmer and more highly flavored if cooked in water containing more or less salt. Salt meats, as corned beef and ham, should be carefully washed in cold water, and soaked in cold water twelve hours before cooking. Ham will be more tender if the temperature never exceeds 165° F.

SOUP. The preceding directions do not by any means apply to making soup. In fact, directly opposite methods must there be followed in order to get the best results. Soup should contain as much as possible of the juices of meat. For this purpose, the meat should be divided into small pieces, covered with cold water, and either soaked in cold water, or slowly brought to the boiling-point, and then allowed to simmer for four or five hours until the meat falls apart. In this way the water dissolves and holds all the extractives, mineral salts and gelatin.

STEWING. Stewing, or *en casserole*, occupies a midway position between boiling and soup-making. The perfection of a stew depends upon the thorough coagulation of the outside juices and the slow process by which it is finished. The temperature should never exceed 180° F. The meat should be divided into small pieces, thrown into a kettle containing two ounces of hot suet and shaken until the outside is thoroughly coagulated; the pieces may then be gathered to one side of the kettle, a thickening of two ounces of flour added, the whole well mixed with the fat, and a pint of water or soup-stock added. The contents of the kettle are then heated to boiling and a level teaspoonful of salt, a salt-spoonful of pepper, and a teaspoonful of browning are added. Such flavorings as bay-leaf, onion, and celery are also usually added. The kettle should be closely covered and the contents cooked for one and a half hours, at a temperature of about 180° F. The meat is best softened in a rich sauce. A *ragout* is nothing but a highly seasoned stew. Stewing is a very economical method of cooking; there is no waste, all escaped juices are held in the sauce, all the nourishment is secured, and if the dish is well cooked and not too greasy or over-seasoned, the meat is tender and easy of digestion.

STEAMING. Steamed foods as a rule are more highly flavored than those boiled, for the reason that in steaming the soluble constituents are not so easily lost as in 'boiling.' The operation of steaming may be carried out in a modern 'steam cooker,' or in a perforated kettle that fits closely over another kettle containing boiling water. If the steam is under pressure, the temperature may be much higher than that of boiling water, and hence the method may be used for sterilizing canned foods; in large establishments the method is also used for the 'baking' of meats. Ordinary home steaming is an excellent method of cooking vegetables, hams, fruit cakes, puddings, and other dishes that require the prolonged application of moist heat. Such vegetables as potatoes, rice, young peas, corn, squash, cucumbers,

pumpkin, and spinach are better steamed than boiled. On the other hand, meats are generally better 'boiled' than steamed. In an ordinary double boiler, which may be used in making eustards and in cooking cereals, the food is obviously neither steamed nor 'boiled,' the heat being a dry heat; the double boiler serves to maintain a constant temperature several degrees below the boiling-point of water.

BRAISING. The operation of braising is intermediate between 'boiling' and baking. The meat is partially browned and cooked in a moist heat. To do this perfectly one must have a well-fitting lid to cover the baking-pan or a so-called roasting-pan, a braising-pot being preferable. The meat should be placed in the pot or pan and partly covered with hot stock or water; seasoning, such as bay-leaf, onion, and celery-seed, should be added, and the pan closely covered. The cooking should be done in a hot oven, fifteen minutes being allowed for each pound of meat, and salt being added when the meat is partly done. A half-hour before serving, the top cover should be removed, and the stock reduced so that it may be served as a sauce. Braising is an economical process of cooking, the constituents lost by the meat being contained almost entirely in the gravy. The process is best adapted to the so-called inferior pieces, as leg of mutton, the upper or under round, and the fleshy part of the shoulder. Braising-pans are frequently sold under the name of 'self-basting' pans.

ROASTING (Grilling, Broiling). Of the several methods of cooking meats, roasting best preserves their juices and develops their flavor. The operation of roasting may be carried out in a metallic vessel ('the roaster,' tin oven, or 'tin kitchen'), fitted up in front of a bright fire, one side of the meat being thus directly exposed to the heat; or else, the meat may be cooked on a revolving spit. The terms broiling, grilling, and roasting denote the same operation; the first two are used to designate the process when applied to steaks or smaller pieces of meat; the term roasting is used in the case of a joint. In this country the process of baking beef has almost entirely replaced that of roasting. In roasting, the meat loses, especially if the joint be a fat one, more weight (fat and water) than in boiling or baking, but is incomparably finer in flavor.

In broiling a steak, the meat should first be placed near a clear, hot fire and turned when one side is seared. When the other side, too, is moderately seared, the steak should be placed at a greater distance from the fire and the cooking thus continued at a lower temperature, five minutes being allowed for a steak one inch thick, ten minutes for a steak one and a half inches thick, and twenty minutes for a steak two inches thick. Seasoning may be added after the steak has been cooked.

BAKING. The process of cooking meat in the dry heat of an oven is properly termed baking. The oven of a stove generally receives its heat from the fire-box, although in very large establishments it is heated by steam under pressure. No matter how great the surrounding heat, a thermometer plunged into the centre of the joint will register scarcely 200° F., the meat being thus cooked in its own juice at a gentle heat. To avoid the considerable waste of fuel which may be involved by it, the process should be ear-

ried out in an apparatus carefully lined and thus rendered capable of holding nearly all the heat produced by a small flame, as the 'Soyer cooker,' Aladdin oven, or Goodrich oven. The heat from an ordinary oil lamp under such an apparatus will bake a piece of meat quickly, thoroughly, and at a minimum cost. The 'feather' oven, an ordinary box entirely surrounded by a thick layer of feather, is still used in many country places, meats and vegetables (such as old beans, peas, lentils) being placed in the feather oven after being heated to boiling, and thus cooked for several hours at a constant temperature slightly below the boiling-point of water.

In baking, a number of mechanical and chemical changes take place. More or less water is driven off, so that the baked foods are, generally speaking, drier than before cooking; heat and the moisture present in foods rupture cell-walls. In this way and by the coagulation of proteids, and possibly also in other ways, the texture and consistency of food are changed. The chemical changes are of the following character: Proteids are coagulated; fats are more or less volatilized and broken down into simpler chemical bodies; and carbohydrates, especially on the surface of foods, are to a greater or less extent caramelized.

FRYING. Frying is cooking by immersion in hot fat at a temperature from 350° to 380° F. The upper limit of temperature answers in the case of croquettes or ceils that are covered with beaten egg; the gentler heat is best adapted to such delicate articles as batters, fritters, crullers, bouchees, and potato or rice croquettes. If the temperature of 380° is not exceeded, the fat does not boil, nor does it smoke, i.e. decompose. It is perhaps chiefly on account of overheating fat that fried foods are but too often unsightly and indigestible. The temperature cannot, of course, be properly regulated without the use of a thermometer. The following test, however, may serve to indicate that the proper frying temperature is nearly reached: a crumb of bread dropped into hot fat will turn brown in ten seconds if the temperature has reached 340° F. The frying-pan should be deep enough to permit of covering the cooking article completely. The high temperature of the fat will then cause the formation, on the surface of the article, of a complete covering, through which neither grease can enter nor juice escape. Without this impermeable covering, the outside of the fried article will be greasy and the inside flavored with the frying material, while if properly fried, the article should be as free from fat as if it had been cooked in water. After removing the article from the hot fat, it should be drained on brown paper, to remove all traces of fat. Croquettes and other made dishes should be covered with beaten egg and rolled in dry bread crumbs before frying. The albumin of the egg will coagulate as soon as it comes in contact with the hot fat and thus make a perfect grease-proof covering. As to the frying material, oil, either olive or cotton-seed, is probably the best form of fat. A mixture of oil and suet is also very good. Further, while neither suet nor lard is suitable to be used isolated, a mixture of the two is found to be well adapted for frying. Butter is unfit for frying, because it decomposes at

too low a temperature. Nor should butter be cooked in making sauces.

SAUTÉING. Unlike frying, sautéing is cooking with fat in a shallow pan.

VEGETABLES. Vegetables not only form indispensable foods by themselves, but also serve to season and impart flavor to soups and made dishes. Potatoes, when served, should be dry and mealy; they should be cooked in water, which should be kept continuously boiling until the vegetable is perfectly tender, and then the water should be drawn off, and the potatoes dusted with salt to absorb some of their moisture. A second baking of potatoes (stuffed potatoes) has the effect of making them more easily digestible. Green vegetables should go over the fire in boiling salted water, the salt in the solution preventing them from absorbing too much water. Old peas, beans, and lentils, however, should be cooked in unsalted water. To preserve the color and prevent the odor of vegetables from spreading through the house, an abundance of water in uncovered vessels should be used in cooking them.

CHAFING-DISHES. These are small utensils made of tin, copper, nickel, or silver, arranged in a frame and heated by alcohol lamps. The better forms are supplied with an under hot-water pan and are very useful for cooking milk or cream dishes that might be easily overheated if cooked directly over a flame. Formerly, a chafing-dish was a shallow saucepan used over a small portable charcoal furnace, principally for keeping things hot. At present such light dishes as melted cheese, Welsh rabbit, creamed chicken, sweetbreads, lobster à la Newburg, oysters, and eggs, are often prepared at the table in a chafing-dish. Venison, breasts of birds, tenderloin of beef, and mushrooms are easily cooked at the table and much better served, directly from a hot dish. Cold boiled potatoes, peas, and string beans are easily warmed in cream sauce made in the chafing-dish.

BIBLIOGRAPHY. Parloa, *New Cook-Book and Guide to Marketing and Cooking* (Boston, 1881); Corson, *Everyday Cookery* (Chicago, 1894); Filippini, *The Table* (New York, 1890); Rorer, *Good Cooking* (New York, 1898); Colombié, *Traité pratique de cuisine bourgeoise* (Paris, 1897); De Salis, *A la Mode Cookery* (London, 1902); Dreyse, *Kochbuch für Kochschulen* (Berlin, 1900); Atkinson, *Suggestions Regarding the Cooking of Food* (Washington, 1894); Richards, *The Chemistry of Cooking and Cleaning* (Boston, 1882). See also **FOOD**; **BREAD**; **MEAT**; **FISH**, etc.

COOK INLET. A bay of the Pacific Ocean, indenting the Sitka District, Alaska, and cutting off the Kenai Peninsula on the east (Map: Alaska, E 3). It is included between latitudes 59° and 61° 20' N., and longitudes 149° and 154° W. In shape long, relatively narrow, and crooked, its length is about 200 miles and its greatest breadth 60 miles. Sudden storms and the high tidal rise make navigation very dangerous. It contains several islands, Augustine Island, with its extinct volcano, being the largest. The coast scenery is grand, comprising active volcanoes, of which Mount Hiamna, 12,066 feet altitude, is the highest, snow-clad mountains, glaciers, and green hills. At its northern extremity are the Knik Inlet and the Turnagain Arm branching to the northeast and east. It

was explored in 1778 by the navigator whose name it bears, in the hope of finding a passage to the Arctic Sea. It receives the waters from a number of rivers, chief of which is the Su-shitna River, coming from the north. Coal is found on its shores, along which are a number of small towns.

COOK or HERVEY ISLANDS. An archipelago of small islands in the Pacific consisting of six larger and a number of smaller islands and reefs, extending from about latitude 18° to 22° S. and from longitude 157° to 163° W. (Map: World, West. Hem., M 4). The total area is 142 square miles. Raratonga, with an area of 31 square miles, is the largest island. The soil is generally fertile, but water is scarce and milk of the cocoa-palm is used as a substitute on some of the islands. The chief products are copra, coffee, and oranges, and the trade is mostly with New Zealand, to which the group has been annexed since 1900. Population, 8400, entirely consisting of Polynesians mostly converted to Christianity. The group was discovered by Cook in 1773.

COOK'S EXCURSIONS. A system of travel originated by Thomas Cook in 1841, by which companies of tourists are conducted by a manager or guide, who makes all the traveling arrangements and directs the disposition of the time. These tours, for which reduced rates are obtained, are very popular with inexperienced travelers, and cover Europe, America, and parts of Asia and Africa.

COOK'S TALE, THE. One of the stories forming Chaucer's *Canterbury Tales*. It is told in the pilgrimage by Roger of Ware, and is the story of a London apprentice, Perkin Revelour. The "Tale of Gamelyn," once supposed to be a part of the "Cook's Tale," is now rejected by critics.

COOK STRAIT. A passage which separates North Island and South Island, New Zealand (Map: New Zealand, E 4). Its greatest width is 80 miles. It was discovered by Captain Cook on his first voyage in 1769.

COOK TOWN. A seaport of North Queensland, Australia, on the Endeavor River, 122 miles northwest of the Palmer gold-field, with which it is connected by rail (Map: Queensland, D 3). Sugar-cane is cultivated in the neighborhood, gold and tin mines are worked, and pearl and sea-slug fisheries are carried on. The port formed by the estuary of the Endeavor River is accessible to ships of 18 feet draught. Municipal enterprise is evinced in the erection of fine public buildings. The town, founded in 1873, was named after Captain Cook, who, in 1770, beached his ship, the *Endeavor*, at this place. A monument was erected to him here in 1899. Population, in 1901, 1936.

COOLEY, LE ROY CLARK (1833—). An American chemist. He was born at Point Peninsula, in Jefferson County, New York, graduated at Union College in 1858, and from 1860 to 1874 was professor of natural sciences in the New York State Normal School. In 1874 he became professor of physics and chemistry in Vassar College. His chair was made that of physics only in 1894. He is the author of several textbooks on chemistry and physics which are highly esteemed among modern educators. These in-

clude *The New Text-Book of Physics* (1880); *The New Text-Book of Chemistry* (1881); and *The Student's Manual of Physics* (1897).

COOLEY, THOMAS MCINTYRE (1824-98). An American jurist and writer on constitutional law. He was born in Attica, N. Y., but removed to Michigan in 1843, and in 1846 was admitted to the bar. He compiled the general statutes of the State, was reporter for the Supreme Court (1858-64), and published eight volumes of reports and a digest of the Michigan decisions. He was professor in the law department of the University of Michigan and dean of the faculty in 1859. In 1861 he became professor of constitutional and administrative law in the school of political science in the university, and also dean, and later occupied the chair of American history in the academic department. From 1864 to 1885 he was a justice of the State Supreme Court, and was Chief Justice from 1868 to 1869. In 1887 he became chairman of the Interstate Commerce Commission, but resigned four years later. Judge Cooley's publications on constitutional law, which are authoritative, are: *The Constitutional Limitations which Rest upon the Legislative Power of the States of the American Union* (1868); *Story's Commentaries on the Constitution of the United States, with Additional Commentaries on the New Amendments* (1873); and *General Principles of Constitutional Law in the United States* (1880).

COOLGARDIE. A mining town in western Australia, 350 miles east-northeast of Perth, with which it is connected by rail and telegraph (Map: Australia, C 5). Gold, discovered here in 1891, has given rich yields since 1893. Population, in 1901, 4213.

COOLIDGE, SUSAN. The pen-name of Miss Sarah Channey Woolsey.

COOLIDGE, THOMAS JEFFERSON (1831—). An American manufacturer and diplomat. He was born in Boston, Mass., and was educated at Harvard and in Europe. In 1892 he was sent as United States Minister to France, but was superseded by James B. Eustis in 1893. He was appointed member of the Joint High Commission to adjust disputes between the United States and Canada.

COOLIE (Beng. *kūli*, Hind. *qūli*, laborer, from Tamil *kūli*, daily hire). A name applied to an unskilled laborer in India and Eastern Asia and to contract emigrant laborers sent from India and China to other countries, especially to the West Indies. In tropical countries where white labor is impossible, there arose with the abolition of slavery a need for cheap labor capable of doing the heavy tasks of plantations, factories, and shipping. For this purpose the acclimated cheap labor of the overpopulated Asiatic countries seemed especially adapted. The coolie trade began about 1834. It was accompanied by abuses which made it little better than a form of slavery, and Great Britain, which had been largely interested in the trade, undertook to put a stop to it in 1855. This threw it largely into the hands of the Portuguese. The coolie trade from Macao to Cuba and Peru was little better than the slave trade so far as its conditions were concerned. The traffic was regulated by the convention of 1866 between China, France, and Great Britain. The requirement by China of a return passage at the end of five years

practically stopped the trade with the West Indies. The number of coolies in British Guiana in 1871 was estimated at 50,000. The advantages and evils of the coolie trade were made the subject of numerous reports, and protective enactments were passed by the Chinese, British, and French governments. Under the Indian Emigration Act of 1883, emigration under contract is allowed only to certain colonies, where good treatment is assured. These are the British colonies of British Guiana, Jamaica, Mauritius, Trinidad, Saint Lucia, Saint Kitts, Saint Vincent, Grenada, Natal, and Fiji, and the French Guadeloupe and Martinique, as well as Dutch Guiana and the Danish Saint Croix.

Besides what may be called the *legitimate* traffic in Chinese coolies (stopped at present), an infamous counterfeits was long carried on at Macao (q.v.). Native crimps brought thousands of their countrymen to that Portuguese island, and shipped them for Cuba and Peru. This 'involuntary emigration,' as it has been called, began in 1848, and as many as 13,000 persons were shipped in the course of a year; but as in reality it was nothing more than an elaborate system of kidnapping, the Chinese and British governments, in 1872, prohibited any vessel suspected of being engaged in this trade from fitting out in any Chinese or British port, and the 'trade' was practically destroyed in consequence. At the close of 1873 the Portuguese Government formally declared the 'exportation' of coolies illegal, and the atrocious traffic may now be considered at an end. Consult, in addition to numerous British and French official papers and reports, Jenkins, *The Coolie: His Rights and Wrongs* (London, 1871); Hope, *In Quest of Coolies* (London, 1872).

COOMANS, kō'māns, *Fr. pron. kō'mān'*, PIERRE OLIVIER JOSEPH (1816-90). A Belgian painter. He was born at Brussels and was the pupil of de Keyser and Wappers at Antwerp. He afterwards accompanied the French troops on their expeditions in Algeria, traveled for several years in Italy, Greece, Turkey, and the Crimea, and on a second visit to Italy in 1857 was so strongly influenced by the Pompeian paintings as to confine his art thereafter mainly to antique subjects. His noteworthy pictures are: "Conquest of Jerusalem by the Crusaders" (1841); "The Battle of Ascalon" (1842); "The Deluge"; "Emigration of Arab Tribes"; "Algerian Dancing Girls"; "The Battle of the Alma" (1855); "Feast of the Philistines" (1856); "Last Days of Happiness of Pompeii" (1863); "Phryne"; "Glycera," and "Lucretia."

COOMASSIE. See KUMASSI.

COON OYSTER. An oyster growing wild near shore, where it can easily be obtained by a raccoon. The name originated in the southern United States, where these oysters are often called 'strap-oysters,' because their clustered manner of growth makes them long, narrow, and thin.

COONS. A popular name for members of the Whig party in 1838-45, when the raccoon formed the emblem of the party.

COON'TIE. See ZAMIA.

COOPER, kōōp'ēr or kup'ēr, ANTHONY ASHLEY. See SHAFTESBURY.

COOPER, Sir ASTLEY PASTON (1768-1841). A celebrated English surgeon, born in Norfolk.

In 1784 he began the study of surgery in London under Mr. Cline, and in 1789 was appointed demonstrator of anatomy at Saint Thomas's Hospital. In 1793 he was appointed professor of anatomy at Surgeons' Hall; and in 1800, surgeon to Guy's Hospital. In 1813 he received the professorship of comparative anatomy in the College of Surgeons. An essay on the effects resulting from the destruction of the *membrana tympani* gained him, in 1802, the Copley Medal of the Royal Society, of which he was elected a fellow three years afterwards. In 1804-07 appeared his great work on *Hernia*. His other works include: *The Principles and Practice of Surgery* (1836-37); *On Dislocations and Fractures* (1822); *Anatomy and Diseases of the Breast* (1829-40); *Anatomy of the Thyroid Gland* (1832). He was the first to attempt the tying of the carotid artery—an attempt which, though unsuccessful in his hands, has since proved effectual in the hands of other practitioners. In 1817 he tried what was considered the boldest experiment ever attempted in surgery—the tying of the aorta—which did not prove successful. Consult Cooper, *Life of Sir Astley P. Cooper* (London, 1843).

COOPER, EMMA LAMPERT. An American artist, born at Nunda, N. Y. She studied at the Cooper Union and the Art Students' League, New York, and traveled abroad. Her picture in water color, "The Bread-Winner," was awarded a medal at the World's Columbian Exposition at Chicago in 1893. Her works include: "Picardy Hillside" (1897); "Through the Meadows" (1900); and "Behind the Dunes" (1895).

COOPER, GEORGE HENRY (1821-91). An American naval officer, born in Fort Diamond, New York Harbor. He was appointed a midshipman in the United States Navy in 1837, and in 1838-42 was attached to the *Constitution*, of the Pacific Squadron. From 1847 to 1861 he was stationed successively on board the receiving-ship at Norfolk, Va., at the naval station there, on board the *Susquehanna* of the East Indian Squadron, again at Norfolk on board the *Roanoke* of the Home Squadron, and at the Portsmouth Navy-yard. Promoted in 1862 to be commander, he was in charge of several vessels during the Civil War, notably of the monitor *Saugamon*, which for seven weeks in 1863 was constantly employed in shelling Fort Sumter and Sullivan's Island. In 1867-69 he commanded the Norfolk Navy-yard, in 1874-78 that at Pensacola, Fla., and in 1880-82 that at Brooklyn, N. Y. From 1882 until his retirement in 1884 he commanded the North Atlantic Squadron, with the flagship *Tennessee* and headquarters at New York. His further promotions were—in 1867 to be captain, in 1874 commodore, and in 1881 rear-admiral.

COOPER, HENRY ERNEST (1857—). An American statesman, born at New Albany, Ind. He graduated at the Boston University Law School in 1878, and subsequently became established at Honolulu. Upon the outbreak of the Hawaiian Revolution he was appointed chairman of the Committee of Safety, and three days later (January 17, 1893) publicly read the proclamation abolishing the monarchy. He was active in the organization of the Provisional Government, and was subsequently appointed Minister of Foreign Affairs (1895-99), Minister of Public Instruction (1896-99), acting President of the Republic of Hawaii (January 9 to March, 1898), and Attor-

ney-General (1899-1900). He also served as Minister of the departments of the Interior and of Finance.

COOPER, JACOB (1830—). An American clergyman and author. He was born in Butler County, Ohio, and was educated at Yale University, at Berlin, and at the Theological Seminary in Edinburgh. He was professor of Greek at Centre College, Kentucky, from 1856 to 1866; professor of Greek at Rutgers College from 1866 to 1883; and professor of ethics and metaphysics at the University of Michigan, from 1883 to 1884. In 1893 he became professor of philosophy and logic at Rutgers College. His publications include: *Creation, a Transference of Power* (1900); and *The Passage from Mind to Matter* (1901).

COOPER, JAMES (1810-63). An American statesman and soldier, born in Frederick County, Md. He graduated in 1832 at Washington College (Pa.), studied law in the office of Thaddeus Stevens at Gettysburg, Pa., and, upon his admission to the bar in 1834, began practice in that place. In 1839-43 he was a Whig member of the Federal House of Representatives, in 1843-48 of the Pennsylvania Legislature, of which he was Speaker in 1847, and in 1848 was elected State Attorney-General. From 1849 to 1855 he was United States Senator. Upon the outbreak of the Civil War he organized the Maryland volunteers, and in 1861 was appointed a brigadier-general in the volunteer army. He was subsequently assigned to the command of Camp Chase, Columbus, Ohio, where he was stationed until his death.

COOPER, JAMES FENIMORE (1789-1851). An American novelist, born at Burlington, N. J., September 15, 1789. His father came of good English and Quaker stock; his mother, Elizabeth Fenimore, was a Swede and also of Quaker ancestry. He was the eleventh of twelve children, and in his second year was taken by his father, William, to a large estate that he had acquired near Otsego Lake shortly after the Revolution. Here had been already laid out the site of Cooperstown. For some years the family lived in a log house, but the settlement prospered, and, determining to make it his home permanently, Cooper's father, who for many years represented the district in Congress, began in the year 1796 to build a manor house, Otsego Hall, which was for many years the finest residence in that region. That Cooper thus spent his boyhood years on the frontier of civilization, surrounded by primeval forests, and never far removed from the possibility of Indian raids, while in daily contact with the red men who came to Cooperstown for trade, was most important to his future literary development. The environment stimulated his imagination, made him responsive to the sense of mystery, and gave him materials for the most important section of his writings, the *Leatherstocking Tales*. He passed through the village school and received private instruction in the family of the Rev. Mr. Ellison, rector of Saint Peter's, Albany, whose refined culture and un-American ideals had a not altogether desirable effect on the style and character of the future novelist, who was something of an aristocrat at heart. In January, 1803, Cooper went to Yale College. Here he learned more out of doors than in the classroom. Indeed, he neglected his studies with such persistent defiance of academic restraints that he was expelled in his third year.

His father resented the action of the faculty, but readers may be glad that the future novelist of the sea should have been led to choose a naval career. To fit himself for this, there being no Naval Academy at that time, Cooper entered the merchant service as a sailor before the mast (September, 1806), and after sixteen months' experience on the sea, in London, and at Gibraltar, received a midshipman's commission (January 1, 1808). He served for a time on the *Vesuvius*, then with a construction party on Lake Ontario, where he saw a new aspect of frontier life and became familiar with the details of ship-building. He saw also other forms of naval service before his resignation in 1811. Meantime he had been married (January 1, 1811) to a daughter of John Peter DeLancey, who came of a conspicuous Tory family. The marriage was happy, but Cooper's resignation on the eve of the War of 1812 did not escape criticism, for a Tory connection seemed to imply lack of patriotism. For the next ten years he lived chiefly in Westchester County, his wife's home, devoting himself to farming and becoming the father of six children before he conceived the idea of authorship. As it was, he began to write, less in emulation of the success of others than through conviction of their failure. He had been reading an English novel aloud, when he suddenly said to his wife, "I believe I could write a better story myself," and proceeded to try it. But *Precaution* (1820), dealing with high life in England, about which Cooper knew nothing, was naturally a failure, and wholly uncharacteristic of his future work. Then when advised to deal with more local themes, he remembered a story that John Jay had told years before about a spy, and his home in Westchester, the scene of much fighting during the Revolution, furnished a fit stage for the play of his fancy. The result was *The Spy* (1821-22), which achieved a success till then unapproached in America, and determined its author to pursue his new-found career. It proved to a very self-conscious generation that it was not impossible for America to produce a novelist almost worthy of being ranked with the great author of *Warley*. Even to-day it remains a stirring narrative that deals adequately with important events, and in Harvey Birch, the Spy, it has added to our national fiction one of its few imperishable characters.

In 1823 Cooper began what is now known as the Leather-stocking Series with *The Pioneers*, for he did not compose the famous five romances in their natural chronological order. Early in the next year he published *The Pilot*, thus practically for the first time joining the ocean to the domain of fiction, just as he had previously added the backwoods, and as he was soon to add the prairie. He also added to Harvey Birch and Natty Bumppo his third great character, Long Tom Coffin. He now removed to New York City, and shortly after had a serious illness. His next novel was *Lionel Lincoln* (1825), a story of Boston during the Revolution. This was not specially successful, but in 1826 *The Last of the Mohicans* placed him at the summit of his popularity and probably represented his highest achievement.

In 1826 he changed his name, in compliance with the wishes of his grandmother, from simple James Cooper to James Fenimore-Cooper, but soon dropped the hyphen. He

could not so easily get rid of the misapprehensions caused by his act in a crude society. Immediately afterwards he went abroad and resided there for seven years, during which time he was the recipient in foreign capitals of many attentions from distinguished people, but felt called upon, as in *The Bravo* (1831), to proclaim vigorously the beneficent greatness of republican institutions. His pride in the better features of American government and society did not, however, prevent him from being one of the first Americans to perceive how really crude his fellow-citizens were, and he told them their faults with a frankness that was not discreet. He exploited his prejudices against New England and in favor of the Episcopal Church, and soon became in his native land a synonym of all that was unpopular and snobbish. His honest, if over-emphatic, strictures outweighed with his comically sensitive critics such fine romances as *The Prairie* (1827), *The Red Rover* (1828—the dates of Cooper's books are often hard to determine exactly), and the less interesting, but creditable, *Water Witch* (1830). But the fault was not entirely on the side of his countrymen, for he took an injudicious part in more or less unnecessary foreign discussions of American political affairs.

On his return to America, in 1833, he at first spent his winters in New York City, but soon took up his permanent abode at Cooperstown. Here he published several volumes of travels, and still not restraining himself from criticism of his countrymen, especially in his story, *Home as Found* (1838), he was again embroiled in bitter controversy and exposed to almost incomprehensible vituperation, which was increased through the fact that in 1837 a dispute had arisen with regard to the claims of his townspeople upon a certain tract of the Cooper estate. The great author's determination to enforce his plain rights was distorted by the newspapers into a heinous crime. And, ironically enough, just at that time this proud aristocrat was being denounced in England for his obtrusive republicanism. But Cooper still plied his pen and produced his *History of the Navy of the United States* (1839), his *Pathfinder* (1840), his *Deerslayer* (1841), *The Two Admirals* (1842), and *Wing-and-Wing* (1842). For the admirable English and Mediterranean setting of the last two stories he was as much indebted to his European stay as he was to his return to the home of his boyhood for his equally admirable setting of the two novels preceding. Mention should be made here of an 'anti-rent series' of novels, dealing with the well-known demagogic agitation against the proprietors of certain large estates in New York. These were *Satanstoe*, *The Chain-Bearer*, and *The Redskins* (1845-46). The first of them contains one of the best pictures that we have of life in colonial New York.

Yet, while Cooper was thus composing novels which have been translated into many languages, and have gained him an undying reputation abroad, especially in France, he was bringing libel suits against many of the Whig editors of his native State, among them Horace Greeley, Thurlow Weed, and James Watson Webb. He was Quixotic enough to conduct these suits himself, and he proved able to win verdicts which finally brought his critics to their senses, although they did little to restore his popularity. A later gen-

eration smiles wonderingly at the whole matter, but sympathizes with the pugnacious author. The last few years of Cooper's life saw the publication of enough novels to occupy an ordinary lifetime, but they added little to his reputation. He maintained his proud independence to the last, and just before his death forbade his family to give any biographer access to his papers, an injunction which has been obeyed, but which has not prevented the life written by Prof. T. R. Lounsbury (q.v.) in the "American Men of Letters Series" (Boston, 1885) from being an admirable piece of work. Cooper died at Cooperstown, N. Y., September 14, 1851. Six months after his death a public meeting in New York, addressed by Daniel Webster and William Cullen Bryant did something to atone for the evil treatment America had accorded one of the very greatest of her writers.

But even after the lapse of half a century, it can hardly be said that Americans are prepared to do full justice to Cooper. His great romances are frequently spoken of as if they were, in the main, fit reading for boys only. His undoubted defects, such as his careless style, his exploitation of his prejudices, his stilted conversations, his inability, as a rule, to draw women who were not distressingly prim, the fact that he wrote entirely too many novels, and that not a few of his men are as wooden as his women—these grave faults have been put forward, while his greater merits have been kept in the background. For, when at his best, as in nearly all the romances named above, Cooper was a very great novelist. He had the narrative faculty of carrying his readers along, however much they might grumble at this detail or that. In "Leatherstocking" he added a character to the small gallery of the world's fictitious personages—something no other American has ever done, except Mrs. Stowe—and in Harvey Birch, Long Tom Coffin, and other sailors, as well as in Uncas, Chingachgook, and other Indians, he created characters of undying power. His Indians, at whom it was once the fashion to sneer, as the creations of a romantic fancy, are now said by ethnologists to be far from overdrawn portraits. He was, as we have seen, practically the first writer to extend the domain of fiction over the sea, the primeval forest, and the prairie. If he was in a way a follower of a still greater romancer, Scott, he won the enthusiastic commendation of another great writer of fiction, Balzac, and he has the unique credit of having written a prose epic of the planting of his native country, which is as spacious and free as the virgin woods and lakes amid which its scenes are laid. In other words, Cooper is a large genius, who ranks well with his fellow-romancers. It is almost absurd to judge one of Cooper's rapidly written romances by the canons one might legitimately apply to a short story by Daudet or Maupassant. When the man is judged in the large by the effects of his best works, and when he is compared with his rivals like Simms and Bird, and with his predecessor, Brockden Brown, his full genius and the service he did American literature emerge splendidly. For carrying power his work has probably had no equal in America; with fewer crying faults he would in all likelihood have been our greatest author.

A full bibliography of Cooper is not needed here, but to the works already named may be added: *The Wept of Wish-ton-Wish* (1829); *The*

Heidenmauer (1832); *The Headsman* (1833); *Sketches of Switzerland* (1835); *The American Democrat* (1838); *The Chronicles of Cooperstown* (1838); *Homeward Bound* (1838); *Mercedes of Castile* (1840); *Wyandotte* (1843); *Ned Myers* (1843); *Afloat and Ashore* (1844); *The Crater* (1847); *Jack Tier* (1848); *Oak Openings* (1848); *The Sea-Lions* (1849); and *The Ways of the Hour* (1850); Lounsbury's *Life*, already mentioned, contains a good bibliography and the best criticism that has yet been devoted to Cooper. Consult, also: Clymer, *James Fenimore Cooper* (1901); Richardson, *American Literature*, vol. ii. (New York, 1887-88); Wendell, *A Literary History of America* (New York, 1900); and essays by Mark Twain, T. W. Higginson, and Brander Matthews.

COOPER, MYLES (1737-85). An English clergyman, scholar, and educator, second president (1763-76) of King's College (now Columbia University). He was educated at Queen's College, Oxford (M.A. 1760), was appointed a fellow of that college, and in 1762, on the recommendation of the Archbishop of Canterbury, came to America as fellow of King's College, professor of moral philosophy, and assistant to President Samuel Johnson. In 1763 he succeeded Dr. Johnson in the presidency. He strengthened the curriculum, and to the academic department and divinity school already existing added a medical school, which was organized in 1768, and in 1769 conferred the first medical degrees bestowed in America. In 1771 he visited England on behalf of the college. A true Oxonian, a high-churchman, and a Tory, he supported the cause of King George against the Colonies, and by such vehement pamphlets as *A Friendly Address to All Reasonable Americans on the Subject of our Late Political Confusion* and *What Think ye of Congress Now?* made himself cordially detested. On May 10, 1775, he escaped from a mob attack upon the college, and the next day took passage for England. He there received the livings of Sulhamsted-Abbots and Cowley, and afterwards became senior minister of the English chapel at Edinburgh. Among those trained under him were Gouverneur Morris, Robert R. Livingston, John Jay, and Alexander Hamilton. He was perhaps the finest classical scholar in eighteenth-century America.

COOPER, PETER (1791-1883). An American inventor, manufacturer, and philanthropist, born in New York City. He assisted his father in his successive occupations of hatter, brewer, and brick-maker; gained such education as his limited means allowed, and from 1808 to 1812 was apprenticed to a carriage-builder. He invented a machine for shearing cloth, which was used during the War of 1812-15; then manufactured cabinet-ware; was for a time a grocer, and finally established a glue and isinglass factory on Long Island, continuing the business for more than fifty years and acquiring great wealth. In 1828 he built large iron-works in Baltimore, and afterwards a rolling and wire mill in New York, and blast-furnaces in Pennsylvania. In 1830 he designed and built the first American locomotive engine, a rude little contrivance, which he exhibited on the Baltimore and Ohio Railroad, and about 1845 made at Trenton the first rolled-iron beams for building purposes. He was among the earliest to promote the laying of the Atlantic cable, and for

eighteen years was president of the New York, Newfoundland, and London Telegraph Company. He invented a method of propelling canal-boats by an endless chain, which, while not adopted at the time, was used later on the Delaware and Raritan Canal. Mr. Cooper served in both branches of the New York Common Council and as a trustee in the Public School Society, an organization formed to advance the cause of public education. Upon the union of that body with the Board of Education he became a school commissioner. In 1876 he received the Independent nomination for President. Peter Cooper engaged in many forms of mercantile life and was successful in all. In gratitude for his success and wishing to afford others opportunities which he himself had never enjoyed, he established in 1853 the 'Cooper Union' (q.v.) in New York City. Consult Carter, "Life of Peter Cooper," in *Century Magazine* (New York, 1883-84).

COOPER, SUSAN FENIMORE (1813-94). An American author, born at Scarsdale, N. Y. She was the daughter of James Fenimore Cooper, the famous American novelist. Her chief publications include: *Rural Hours* (1850), a year's journal of country scenes; *Rhyme and Reason of Country Life* (1854), a volume of selections; and *Mount Vernon to the Children of America* (1858).

COOPER, THOMAS (1759-1840). A British-American scientist, political economist, educator, and publicist, conspicuous for his versatility and his radicalism in politics. He was born in London, studied for a time at Oxford, and was admitted to the bar. In 1792 he spent four months in Paris and while there acted with James Watt, the famous inventor, as a delegate from the Manchester Constitutional Society to the Patriotic Societies of France. For this both he and Watt were warmly criticised at home, especially by Edmund Burke, who took them to task in a somewhat intemperate speech before Parliament. To this speech Cooper replied in a caustic pamphlet entitled *A Reply to Mr. Burke's Inveictive Against Mr. Cooper and Mr. Watt* (1792), the circulation of which in a cheap edition designed to reach the lower classes was prohibited by the British Government. After an unsuccessful attempt, as a bleacher and calico-printer, to apply a secret process learned in France for preparing chlorine from sea-salt, he emigrated to America in 1795, and for a short time practiced law in Northumberland County, Pa. He soon began to take an active part in support of the Anti-Federalists in current political discussions, and for a violent attack upon President John Adams in the Reading *Advertiser* of October 26, 1799, was tried under the Sedition Law (see ALIEN AND SEDITION ACTS), was convicted of libel, and, besides being fined \$400, was sentenced to six months' imprisonment. He was appointed a land commissioner for the State of Pennsylvania in 1806, and subsequently acted as president judge of a common pleas district until 1811, when he was removed because of his alleged arbitrary conduct and overbearing temper. He was professor of chemistry in Dickinson College, Pa., from 1811 to 1814, and of mineralogy and chemistry in the University of Pennsylvania from 1816 to 1821, and from 1820 to 1834 was president of South Carolina College, where he acted also as professor of chemistry and political econ-

omy, and for a time of 'rhetoric, criticism, and belles-lettres.' From 1834 until his death he was engaged, with Dr. McCord, in revising the statutes of South Carolina, which were published in ten volumes (Columbia, 1836-41). Though he was strongly condemned by many for his radicalism in philosophy, religion, and politics, he undoubtedly exercised a powerful influence in the South, especially in South Carolina, and did much to inculcate in the minds of the politicians of his State the doctrine of extreme States' rights, nullification, and free trade. In a speech which was widely circulated in 1827, he openly urged both nullification and secession upon South Carolina, and he was unquestionably responsible to a considerable degree for the nullification measures of 1832-33. Besides editing *The Emporium of Arts and Sciences* at Philadelphia from 1812 until 1814 and writing numerous pamphlets and articles for the press, he published: *Some Information Respecting America* (1794); *Political Essays* (1800); *An English Version of the Institutes of Justinian* (1812); *A Practical Treatise on Dyeing and Calico Printing* (1815); *Lectures on the Elements of Political Economy* (1826); and *A Treatise on the Law of Libel and the Liberty of the Press* (1830).

COOPER, THOMAS (1805-92). An English agitator, one of the leaders in the Chartist movement, poet and author. In youth he was a shoemaker, but at the age of twenty-three became a schoolmaster. He was the leader of the Leicester Chartists in 1841, lectured during the riots of that year, was found guilty of conspiracy and sedition, and was sent to prison for two years. While in jail he wrote an epic poem, *The Purgatory of Suicide*, and a series of stories entitled *Wise Saws and Modern Instances*. Some time afterwards he wrote papers on *The Condition of the People*; later still, *Triumphs of Perseverance and Triumphs of Enterprize* (1856). In 1848 he was lecturing; in 1849 he edited a radical penny paper, *The Plain Speaker*, and in 1850 a free-thinking publication, *Cooper's Journal*. Near the close of 1855 he gave up skepticism, and afterwards lectured in support of Christianity. He published *The Bridge of History Over the Gulf of Time* (1871); an *Autobiography* (1872); and *Collected Poems* (1878).

COOPER, THOMAS AETHORPE (1776-1849). An actor who was born at Harrow, England, but came to this country in 1796 and for many years held a leading place on the American stage. He made his debut in Edinburgh, and afterwards played at Covent Garden, London, before coming to America, where he made his first appearance in Philadelphia, in the rôle of Macbeth. He quickly won great popularity. Later he went to New York and remained several years, gaining a wide reputation. In 1803-04 he was again in London and had a successful engagement at Drury Lane, in Shakespearean tragedy. A later visit to London, in 1827, met with a less flattering reception, for which he was required, however, on his return to America; but before he retired from the stage his popularity in this country had greatly declined, as had also, apparently, his artistic talents. Among his best parts were Shylock, Richard III., Othello, Damon, and Virginius. In later life he was for a time a custom-house officer in New York, a son of Presi-

dent Tyler, having married one of Cooper's daughters. It was at the home of this daughter in Bristol, Pa., that Cooper died. Consult: Ireland in Matthews and Hutton, *Actors and Actresses of Great Britain and the United States*, vol. ii. (New York, 1886).

COOPER, THOMAS SIDNEY (1803-1902). An English painter, born in Canterbury. He was a pupil of the Royal Academy in London, and of Verboeckhoven in Brussels. He first exhibited at the Royal Academy in 1833, where he continued to send work for sixty-seven consecutive years. He attained considerable reputation as a painter of cattle, and the skill and spirit with which he depicted them made his works very popular. Among his numerous pictures, in some of which Frederick R. Lee (q.v.) painted the landscapes, are "Etrick Shepherds" (1842); "Cattle at Pasture" (1843); "Summer Evening" (1846); "Charge of the Household Brigade, Waterloo" (1847); "Snowed Up" (1867); "Passing Shower" (1870); "Children of the Mist" (1872); "God's Acre" (1875); "Isaac's Substitute" (1880); and "In the Rob Roy Country" (1885).

COOPERAGE (from *coop*, AS. *cypa*, OS. *cōpa*, OHG. *chuofa*, Ger. *Kufe*, vat, from ML. *copa*, Lat. *cupa*, vat, Gk. *κῦρη*, *kypē*, hole, Skt. *lūpa*, well). The art of making vessels of pieces of wood bound together by hoops. It is a very ancient art, such vessels having been in use among the Romans at the beginning of the Christian Era. The upright pieces forming the sides of a barrel, or cask, or other cooper's work, are called *staves*; and, as casks are usually larger in the middle than at the top and bottom, this swelling, called the *belly* or *bulge*, is formed by skillfully shaping each stave so that it shall form part of the required double conoid, and so that, when all are built and hooped together, their edges shall coincide perfectly. For this purpose, each stave is made broadest in the middle, and narrowed down in a curved line toward each end. A skillful cooper can produce this curve so accurately that no further fitting or alteration is needed when the staves are put together. The staves are made to meet at their inner edges, and by driving the hoops very hard, the inner part is compressed until the slight gaping outside is closed, and thus slight inaccuracies of fitting are remedied. There are several branches of cooperage. The *wet* or *tight* cooper makes vessels for holding liquids. The *dry* cooper does inferior work, such as barrels for containing dry goods, where an inferior degree of accuracy is sufficient. The *white* cooper makes churns, pails, etc., which for the most part have straight sides. The best wood to employ is oak, which must be thoroughly dried before the staves are put together. In warm countries the drying of the sun is sufficient, and casks are therefore mounted in summer only; but in northern countries artificial drying is commonly resorted to. The hoops are hammered down from the narrow to the wide part of the cask, by means of a mallet striking a piece of wood held against the hoop. Iron hoops are sometimes put on hot, in order that their contraction on cooling may bind the work together.

Like most other processes of manufacture, the cooper's trade has changed in modern times, with the substitution of machinery for hand work. The machinery used is commonly termed barrel-making machinery; but it is employed, with

suitable modifications, in making casks and kegs as well as barrels. Barrel-making machinery may be divided into machines for the manufacture of staves, machines for manufacturing heads, and machines for setting up and finishing the barrel. The saw used for cutting staves is a cylindrical sheet, having teeth upon one end; the blocks of wood are clamped in the usual manner, and the staves fall within the cylinder. They are then laid upon an endless conveyer, which carries them against two circular saws that cut them a definite length. Each piece is then placed in a pair of clamps, and moved against a rotary wheel provided with cutters, that dress the edge to the required bilge and bevel; the *bilge* is the increased width midway between the ends, which causes the enlarged diameter of the cask at the middle; the *bevel* is the angle given to the edge conforming to the radius of the cask. The surface of the stave is smoothed by passing it under revolving cutters; a recent form of machine takes off the surplus wood from riven staves without cutting across the grain, following winding or crooked pieces as they are split from the block. The heads are usually made of several flat pieces jointed and fastened with dowels, or pins of wood. The edge of each piece is pushed against the side of a rotary disk, provided with cutters that instantly straighten it; it is then pushed against bits that bore holes for the pins to be afterwards inserted by hand. Several boards being pinned together, enough to make a head, the whole is first smoothed on one side and dressed to a uniform thickness; then it is elamped between two disks, and, as these disks turn, a saw trims the head into a circle with a beveled edge; if the wood is green, an oval form may be given to provide against shrinking.

The barrel has next to be 'set up.' A sufficient number of staves are set into a frame, their edges refitted if necessary: stout iron hoops, called 'truss hoops,' pushed up from below grasp the lower ends tightly, and the whole may be lifted from the mold. One end of the barrel is formed, but the other end is open and flaring. A rope is passed about the open end and taken to a windlass, and the staves are drawn together by tightening the rope; in this stage the barrel is heated, to cause the staves to yield more easily to their required form. The barrel is now leveled by placing it upon a horizontal bed and bringing down upon it a powerful disk that presses upon its ends and forces the staves into their proper position. A machine is devised which trusses and levels the barrel at a single movement. The slack barrel stands in its truss hoops, two on each end; those of the lower end rest on strong supports; those of the upper end are seized by hooks whose handles pass down through the platform to a common level; when all the parts are in place, powerful machinery pulls the upper trusses down, at once driving the barrel into the lower trusses, drawing together both ends, and leveling the whole. Each end of the shell, thus made, passes under a rotary cutter which forms a *croze*, or groove, to receive the head, and chamfers, or bevells, the ends of the staves. The heads are put in and the hoops set by hand. The barrel is then made to turn under a smoothing tool and rapidly finished.

COOPERAGE (from Dutch *koper*, sort of boat, from *kopen*, Ger. *kaufen*, Goth. *kaupōn*, AS.

cypan, to buy, from Lat. *caupo*, innkeeper). The sale of tobacco, alcoholic liquors, or clothing to fishermen in the North Sea, or the barter of these articles for fish, nets, or other such property. As the goods for sale had escaped duty, the business was profitable, but it demoralized the fishermen. In 1882 a mission was founded for supplying the fishermen with good clothing, literature, etc., at a fair cost, and in 1887 six nations concerned signed an agreement to prohibit the sale of intoxicating liquors to fishermen at sea. Next year Great Britain embodied the terms of this convention in the North Sea Fisheries Bill.

COÖPERATION (Lat. *cooperatio*, from *cooperari*, to coöperate, from *co-*, together + *operari*, to work, from *opus*, Skt. *apas*, work). In the widest sense of the word, all production is the result of the coöperation of nature, labor, and capital; but economists have generally restricted the term to three classes of enterprises, namely: (a) Coöperative distribution; (b) coöperative production; and (c) coöperative societies for banking or loaning money. It is sometimes extended to profit-sharing, by which the employee shares beyond his wages to some extent in the profits of his employer: but this is a misapplication of the term, for coöperation starts with the worker, while profit-sharing starts with the employer.

COÖPERATIVE DISTRIBUTION. This is sometimes called consumers' coöperation, and is an effort to do away with the middleman and to have the consumers themselves organize distributive stores and reap the profit which would otherwise fall to the storekeeper. There can of course be no doubt that under existing conditions of production the merchant who serves as an intermediary between the producer and the consumer, or between the wholesale dealer and the retail purchaser, performs an important social service for which he is entitled to a reasonable remuneration; but, unfortunately, the number of these intermediaries has increased beyond all measure; and, as they all must strive to subsist, there is still, in spite of great improvements in the distributive process, a vast difference between wholesale and retail prices. A French economist, Prof. Charles Gide, estimates that more than one-tenth of the population of France depends on commerce for its subsistence. In other words, every ten persons support one intermediary. The economic waste of commercial competition indicated by these facts aroused, many years ago, the condemnation of such social reformers as François Fourier (q.v.) and Robert Owen (q.v.); but the first lasting, successful attempt to dispense with the middleman was made in 1844, by twenty-eight poor weavers of Rochdale, near Manchester. They organized, under the name of 'Equitable Pioneers of Rochdale,' to supply themselves with provisions, beginning with flour, butter, sugar, and oatmeal. Business was transacted at first in a small room in Toad Lane, with a capital of £28, each member having subscribed an equal share. They overcame all difficulties, and outlived not only internal divisions and jealousies, but also external prejudices and opposition. The success of the store led to many imitations, a considerable number of which, however, had only a very short existence, owing in many cases to want of harmony among the members, bad

management, insufficient capital, or dishonest officials. Notwithstanding all difficulties, coöperation continued to increase, and in 1864 no less than 295 societies in Great Britain made returns to the registrar, possessing a share and loan capital of £774,000, doing an annual trade of nearly £3,000,000, and making an annual profit of £225,000. It was then proposed to form a federation of societies for the purpose of undertaking the wholesale trade of the movement, thereby protecting the societies from the imposition of the wholesale traders, and securing the profits of wholesale dealing. The 'North of England Wholesale Society' began business in Manchester in 1863, and in 1871 became the 'English Wholesale Society.' This organization has purchasing and forwarding depots not only in England and Ireland, but in New York, Hamburg, Copenhagen, Calais, and Rouen. It owns six steamships, which ply between England and the Continent. Following the same lines, the 'Scottish Wholesale Society' was formed in 1868, and commenced business in Glasgow. Both of these organizations have prospered and grown, and now supply a large portion of the goods sold by the retail societies. They not only purchase direct from the producers, but produce on their own account, or in connection with other associations. The latter activity falls under the head of productive coöperation, which will be discussed later. In 1895 the membership of the societies was nearly 1,500,000, and their share capital amounted to over \$80,000,000; the net profit of the concerns was nearly \$27,000,000, after paying 5 per cent. interest on capital and accumulating a surplus. About one-sixth of the population of Great Britain have their wants in whole or in part supplied through coöperative stores.

In the United States isolated experiments of a similar nature were made as early as the eighteenth century. In 1845 the 'Workmen's Protective Union' of Boston organized a successful store, which was afterwards carried on under the name of the 'New England Protective Union.' The 'Patrons of Husbandry,' founded in 1867, for a time developed a variety of coöperation by encouraging the local 'granges' to form purchasing clubs and to employ agents to buy supplies. The 'Sovereigns of Industry,' a secret order with ritual, founded in 1874 to do for the artisan classes what the 'Patrons of Husbandry' were doing for the farmers, founded numerous coöperative stores on lines resembling the 'Rochdale Pioneers.' In 1877 the organization was doing a business of \$1,089,372, but by 1880 the order had collapsed, although not a few stores in various parts of the United States still remain as a result of the movement.

The foundation of a coöperative store on a small scale is a simple matter in itself. A group of consumers meet to discuss rules and regulations for the enterprise, and agree to furnish the necessary capital by subscribing, say, five dollars each. As coöperative stores almost always do business on a cash basis, the original capital need not be very great. Each share of capital receives a fixed rate of interest, say 5 per cent. The dividends may be credited as payments on additional shares up to the maximum number of shares allowed any one shareholder. In this wise the store serves also as a savings-bank for the members. Usually the money sub-

scribed as share capital need not all be paid at once; weekly payments of ten cents are customary. Whatever profit the store makes after deduction of the interest on loans, the charge for depreciation in the value of the stock and plant, 5 per cent. dividend on the capital, a reserve fund, and perhaps a bonus to employees, is divided among the purchasers according to the respective amounts of their purchases. Goods are sold at the usual prices of private stores. Outsiders may buy at the store, but only members receive shares in the gains. These shares are also usually credited as payments on the stock shares until they are paid in full. The amount of each member's purchase is recorded by means of checks distributed with every sale. The management of the business is in the hands of an executive committee, which appoints the storekeepers, and oversees the purchase of goods and the finances. It is evident that the success of the society will depend largely on this committee, which must be honest and efficient.

COÖPERATIVE PRODUCTION. An attempt to solve the more difficult problem of doing away with the employer, the 'entrepreneur,' by having the workers furnish their own capital. Under our present economic system the distribution of wealth among the agents of production involves a grave conflict of interests, which may lead to industrial warfare and jeopardize the welfare of society by separating laborers and capitalists into distinct antagonistic classes; but the relation between capital and labor is most satisfactory when there is no sharp separation into classes. Productive coöperation, therefore, by uniting men in the twofold capacity of workers and capitalists, has been recommended by many social reformers as a cure for our social ills. The voluntary union of a number of workers to conduct an enterprise collectively is by no means a modern invention. Schmoller and other economic historians have shown that it is, indeed, one of the earliest forms of industrial organization. The guilds of the Middle Ages were managed by associations of workmen, each one furnishing a small share of the capital required for the conduct of industry under mediæval methods. But their conservatism of method led to their displacement by capitalistic industry, and it is not until the nineteenth century that we find widespread attempts to reestablish coöperative productive enterprises; but only a few of them, notably among masons and piano-makers, were successful.

Ferdinand Lassalle (q.v.) believed that the foundation of coöperative societies of production, with State aid in providing the necessary capital, would gradually transform present economic society into a socialistic one.

The first productive association in the United States of which we have any record was that of the 'Boston Tailors' Associative Union,' which was formed in 1849, but did not last long. There were many other experiments of a like nature, the most promising of which seems to have been the stove foundry of the Iron Moulders' International Union, started in 1867 in Allegheny County, Pa. But the paid-up capital proved insufficient at a critical moment, and the enterprise failed. By far the most successful experiment in the United States is found among the coopers of Minneapolis. In 1868 a few journeymen coopers made an attempt

to manage industry for themselves; they were so successful that in 1874 a strong organization known as the 'Coöperative Barrel Company' was formed, with a membership of about twenty coopers. They bought a shop for \$3000, paying \$1000 cash. The profits were to be divided in proportion to the work done. In 1885 the paid-up capital amounted to \$50,000; the membership had reached 120, besides 20 employees working for wages. The number has since been reduced.

This example has been followed by others, and frequently with success. Experience seems to show that where articles are produced to order and not for the general market, coöperative production may succeed, but that these enterprises fail when they are confronted with the difficulty of adjusting the supply to the variations of the market demands.

COÖPERATIVE CREDIT AND BANKING ORGANIZATIONS. These are founded for mutual financial aid, and have been wonderfully prosperous in Germany, where they do a business of hundreds of millions of dollars. In 1849 Herr Schulze (Schulze-Delitzsch) founded a coöperative society to purchase raw material, among thirteen cabinet-makers in Delitzsch, his native town. In the next year he founded the first of his loan associations (*Vorschussvereine*), which differed from the earlier banks in that the persons to whom loans could be granted must themselves be members of the association, paying regular monthly contributions. They thus themselves indirectly furnished the security for the credit afforded them. While these loan associations put the lender's interest foremost, Raiffeisen, another German, born in the Westerwald, organized a coöperative bank in 1849 which placed the borrower's interest as the keystone of his system. Both systems have spread over the country, especially Schulze-Delitzsch's banks, numbering over a thousand in 1892, with over half a million members and a paid-up capital of nearly \$30,000,000. In Italy, at the instigation of Signor Luzzatti, an organization of a very similar sort was founded in 1866, at Milan, and has been widely imitated. As a matter of fact, all these 'people's banks' bear a close resemblance to our American building and loan associations (q.v.), whose special and marked development in this country makes the United States one of the pioneer countries and chief homes of this form of coöperation.

BIBLIOGRAPHY. Holyoake, *History of Coöperation in England* (2 vols., London, 1885); "History of Coöperation in the United States," a series of essays published in *Johns Hopkins University Studies* (Baltimore, 1888); Potter, *The Coöperative Movement in Great Britain* (London, 1891); *Reports of the (English) Coöperative Congresses* (17 vols., Manchester, 1869-1900); Wright, *Massachusetts Labor Report* (Boston, 1895); id., *Manual of Distributive Coöperation* (Boston, 1885); *Report of English Royal Commission on Labor* reviews coöperation in all European countries (London, 1886); Gilman, *Profit Sharing Between Employer and Employed* (New York, 1888); articles in *United States Labor Bulletin* (Washington). See PROFIT-SHARING; BUILDING AND LOAN ASSOCIATIONS; COLLECTIVISM.

COOPERIA, *kōō-pē'ri-a*. A genus of two or three species of tender, bulbous plants, of the order Amaryllidaceæ. The narrow, elongate, twisted leaves appear with the fragrant solitary

flowers in summer. The flowers, which resemble those of the Zephyranthes, but have erect instead of versatile anthers and, unlike other members of the order, bloom at night, are two inches or more in diameter, usually waxy white, blushed with pink outside and green-tinged within. Those of *Cooperia pedunculata* (giant fairy-flower), the most popular species, are larger, of purer color and longer duration than those of *Cooperia Drummondii* (evening star), the other well-known species. A species or variety, *Cooperia Oberwetteri*, said to have bright-green flowers, was advertised during the last years of the century just closed. The plants are of easiest culture. They do well in garden soil, and if dug at the approach of frost and stored in dry soil, where the temperature is maintained below 50° F. but not so low as 32°, they may be kept over winter without trouble. The genus is named after Joseph Cooper, an English gardener. For illustration, see Colored Plate of AMARYLLIDACEÆ.

COOPER RIVER. A river rising in Berkeley County, S. C. It flows southeast, and unites with the Ashley River below the city of Charleston, in the estuary forming Charleston Harbor (Map: South Carolina, E 3). It is navigable for 30 miles to the canal connecting it with the Santee River.

COOPER'S CREEK. An Australian river springing from two headwaters, the Thomson and Victoria, in Queensland, and flowing southwest through South Australia into Lake Eyre. During the rainy season the river rises 20 feet and widens to two miles, while in the summer season its lower course is dry (Map: Australia, P 4). On its banks the explorers Burke and Wills succumbed to starvation in 1861. Consult: Burke and Wills, *Exploring Expedition* (Melbourne, 1861); Wills, *Exploration* (London, 1863).

COOPER'S HILL. A descriptive, or, as Dr. Johnson termed it, a 'local' poem, by Sir John Denham (1642), issued in perfected form in 1665. It suggested many lines in Pope's *Windsor Forest*.

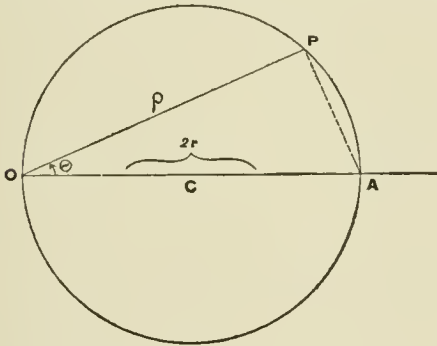
COOPERSTOWN. A village and county-seat of Otsego County, N. Y., 52 miles southeast of Utica; at the outlet of Otsego Lake, and on the Cooperstown and Charlotte Valley Railroad (Map: New York, F 3). It is in a hop-growing and farming region, and contains a cheese-factory, box-factory, etc. The village is growing in popularity as a summer resort, and has a park, 'Cooper Grounds,' and a library and Y. M. C. A. building. Cooperstown was first incorporated in 1812, and is now governed under a charter of 1889, revised in 1895. The executive holds office for a year. Population, in 1890, 2657; in 1900, 2368.

The land on which Cooperstown stands was the site of an Indian town, and in 1769 became the property of George Croghan, who attempted, unsuccessfully, to found a settlement. In 1785 it came into the possession of Judge William Cooper, who in 1786 founded a village, and in 1790 moved thither with his family, including J. Fenimore Cooper, the future novelist, then an infant. The latter lived here thirty-seven years, and is here buried. Consult: Cooper, *The Chronicles of Cooperstown* (Cooperstown, 1838), and Livermore, *A Condensed History of Cooperstown* (Albany, 1862).

COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART. An institution established in New York City in 1859 for the free instruction of the working classes in applied science, art, and social and political science. The Union embodies the social philosophy of its founder, Peter Cooper (q.v.), and is unique among educational institutions in the United States. Its central idea is to afford working people full opportunity, by means of day and evening classes, to obtain a mastery of the technical trades and sciences; and also, through the medium of lectures, reading-rooms, and art and scientific collections, to induce a more discerning citizenship and a broader mode of living. To accomplish these purposes, Mr. Cooper erected a large building at the point where the Bowery divided into Third and Fourth avenues, and deeded both land and building, valued at \$630,000, to a self-perpetuating board of trustees. This board was to consist of not less than five or more than six members, and upon the board was especially enjoined the establishment of regular courses of evening study; the maintenance of a library, galleries, and collections; the establishment of a school of art for women, in order that those who "might otherwise struggle through a life of poverty and suffering," should be raised to "competence and comfort"; and the establishment of a polytechnic school "equal to the best technological schools now established or hereafter to be established." By 1864 the trustees had developed this broad scheme of education so far as their funds permitted; but afterwards, for many years, the Union was unable through lack of endowments adequately to extend in scope, and was even obliged to turn away large numbers of its constantly increasing applicants. Indeed, except for large sums given by Peter Cooper, and afterwards by Edward Cooper and William Cooper, and by Mr. and Mrs. Abram S. Hewitt, the Union remained practically unendowed until 1900, when Andrew Carnegie gave \$300,000, and later \$300,000 more. These sums, together with considerable gifts made by Mr. Abram S. Hewitt and others, permitted the final rounding out of the original plans. The scope of the institution now includes, besides day and evening courses in technical science and art, instruction for women in stenography, typewriting, and telegraphy, courses in decorative composition, architecture, and interior decoration, in elocution, oratory, and debate, and several lectures a week in engineering, civics, and ethics. Degrees are conferred in science, and in civil, electrical, and mechanical engineering. In 1902 the annual income of the Union approximated \$100,000, its endowments amounted to over \$2,000,000, and the total value of property under its control to \$3,200,000. In the same year 2399 pupils were enrolled, of whom 825 entered the evening school of science and 1150 the evening art department: visitors to the reading-rooms numbered 500,000; while the attendance at the lecture-rooms was estimated to aggregate 150,000. The trustees originally appointed in 1859, and to whose untiring efforts the success of the Union must in large measure be ascribed, were: Peter Cooper (q.v.), Daniel F. Tiemann, Wilson G. Hunt, Edward Cooper, Abram S. Hewitt, and John E. Parsons.

COÖRDINATES (from ML. *coördinare*, to coördinate, from Lat. *co-*, together + *ordinare*, to arrange, from *ordo*, order). Magnitudes which serve to determine the position of an element—point, line, or plane—relative to some fixed figure. For instance, latitude and longitude are arcs (or angles) that define the position of a ship at sea relative to the equator and the prime meridian; latitude, longitude, and elevation above sea-level serve to determine the position of a balloon.

The method of treating geometry analytically by use of coördinates is due chiefly to Descartes (1637), although the terms coördinates and axes of coördinates were first used by Leibnitz (1694). For the explanation of rectangular coördinates as used in plane geometry, see ANALYTIC GEOMETRY. As there explained, the axes in the rectangular system are at right angles to each other, but it is often more convenient to employ a system in which the axes form oblique angles. Coördinates referred to such a system of axes are called oblique coördinates. The notation is the same as in the rectangular system, and the lines which determine a point are drawn parallel to the axes; thus the coördinates (x, y) of a point form the outer adjacent sides of a parallelogram of which the axes form the inner sides. Another system in common use is that of polar coördinates. This involves two magnitudes—the linear distance from a fixed point and the angular distance from a fixed line.



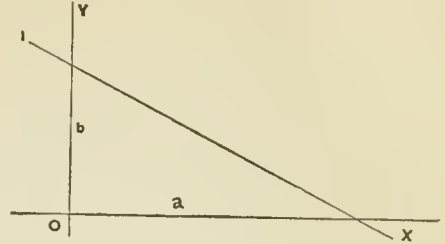
In the figure the position of point P is determined by the distance ρ from O, and the angle θ between ρ and the fixed line OA. O is called the pole and ρ the polar radius or radius vector. If OA passes through the centre C of a circle, the polar equation of the circle is $\rho = 2r \cos \theta$. That is, the values of ρ and θ , which satisfy this equation, determine points on the circle. If C is taken as the pole, the equation of the circle is evidently $\rho = r$. Rectangular coördinates may be changed to polar coördinates, and vice versa, by means of the equations

$$x = \rho \cos \theta, \quad y = \rho \sin \theta;$$

$$\rho = \sqrt{x^2 + y^2}, \quad \theta = \tan^{-1} \frac{y}{x}.$$

So far we have considered lines as loci of points whose coördinates satisfy given relations; but it is often more convenient to select magnitudes which determine lines passing through a given point. Thus $ux + vy + l = 0$ may be taken as the equation of a straight line in which u

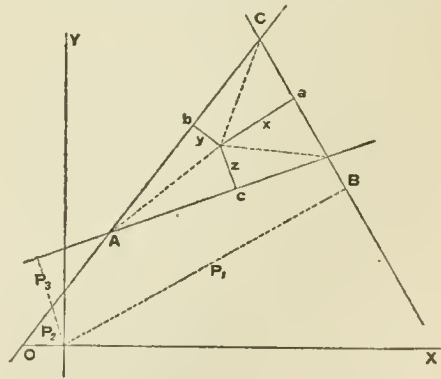
is the negative reciprocal of the intercept on the X-axis, and v the negative reciprocal of the inter-



cept on the Y-axis. For if $y = 0, x = -\frac{l}{u}$, and if $x = 0, y = -\frac{l}{v}$. The segment a , in the figure, is the intercept on the X-axis, and corresponds to $y = 0$, and b is the intercept on the Y-axis and corresponds to $x = 0$. Therefore, $a = -\frac{l}{u}$ and $b = -\frac{l}{v}$, whence $u = -\frac{l}{a}$ and $v = -\frac{l}{b}$. If x and y are regarded as constants

and u, v as variables in the equation $ux + vy + l = 0$, this is the equation of all lines passing through the point (x, y) —that is, of a pencil of which the point (x, y) is the vertex. Hence this equation is called the line-equation of the given point, and the system of coördinates one-point intercept coördinates. Two-point or bipunctual coördinates determine the position of an element in the plane by reference to two fixed points and a given direction. As in one-point coördinates there are two kinds, line coördinates and point coördinates, so these classes exist in two-point coördinates. Bipunctual line coördinates are the distances of a variable line taken in a constant direction from two fixed points. Bipunctual point coördinates are, each, the negative reciprocal of the distance measured in a given direction from one of two fixed points to the line determined by the variable point and the other fixed point.

Although two magnitudes are sufficient to fix the position of a point in a plane, the introduction of a third has the advantage of rendering homogeneous certain equations involved; how-



ever, the coördinates of a single element are, in general, connected by a non-homogeneous relation. Thus, if x, y, z in the figure represent the perpendicular distances of a point from the

sides a, b, c of the triangle ABC , they are connected by the relation $ax + by + cz = k = 2 \times$ area of ABC , or $x \sin A + y \sin B + z \sin C = a$ a constant. (See TRIGONOMETRY.) We may also take x, y, z oblique to a, b, c , each forming the same angle with its corresponding side. Equations between the coördinates of two or more points in this system are homogeneous, as $mx + py + qz = 0$, the equation of a straight line. Such coördinates are called trilinear or homogeneous coördinates. These form a special case of barycentric coördinates, the first homogeneous coördinates in point of time, introduced by Möbius (q.v.) in his *Der barycentrische Calcul* (1827). Tetrahedral space coördinates belong to the same class. If in the above figure rectangular axes are also assumed, and if P_1, P_2, P_3 are the perpendiculars from the origin upon the sides a, b, c , respectively, then

$$\frac{x}{P_1} = \frac{BPC}{CBA}, \quad \frac{y}{P_2} = \frac{ACP}{CBA}, \quad \text{and} \quad \frac{z}{P_3} = \frac{BAP}{CBA};$$

these expressions may be designated by x', y', z' , and be employed to determine the position of point P (P denoting the point at which x, y , and z meet). Since they are expressed in terms of areas, they are called areal coördinates. In either the trilinear or areal system a point is determined if the ratios only of the coördinates are known. If $lx + my + nz = 0$ is the trilinear equation of a straight line (L in the

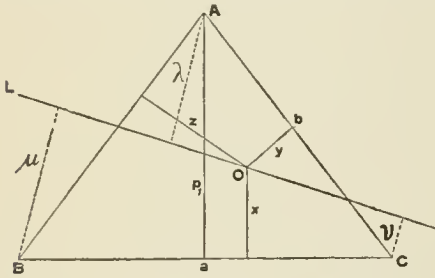


figure), then by making x, y, z constant and l, m, n variable, the equation is called the tangential equation of the point $O(x, y, z)$. Since l, m, n are variable, the equation represents any straight line passing through O . If λ, μ, ν are the perpendiculars from A, B, C , upon the line L , and p_1, p_2, p_3 the altitudes of the triangle ABC , the equation of the point O is

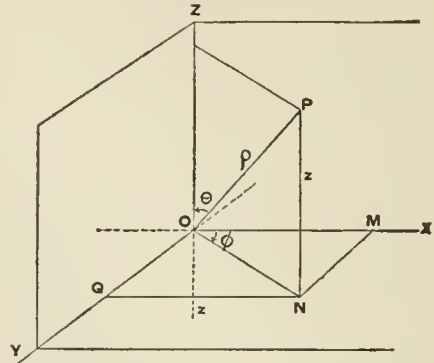
$$\frac{\lambda x}{p_1} + \frac{\mu y}{p_2} + \frac{\nu z}{p_3} = 0$$

When the perpendiculars λ, μ, ν are taken for the coördinates of the line, the coefficients become the areal coördinates of the points referred to the same fundamental triangle. Any homogeneous equation in l, m, n as tangential coördinates is expressed in terms of λ, μ, ν by substituting $\frac{\lambda}{p_1}, \frac{\mu}{p_2}, \frac{\nu}{p_3}$ for l, m, n respectively.

An equation in λ, μ, ν of a degree higher than the first represents a curve such that λ, μ, ν are always the perpendiculars upon the tangent. The curve must therefore be the envelope (q.v.) of the line (λ, μ, ν) . Tangential coördinates are often called Boothian coördinates, in honor of James Booth, who invented them. Bilinear coördinates are magnitudes which determine a point with reference to two series of circles

which intersect one another at a constant angle. Generalized, Lagrangian, Eulerian, and Rodrigue's coördinates are special systems used in treating certain problems of mechanics.

From the idea of coördinates of an element in a plane we easily pass to the notion of coördinates of an element in geometry of three dimensions. The determination of a point in such space requires three coördinates. In the Cartesian system these are represented by x, y, z . An origin being taken (as O in the figure), and three



axes, OX, OY, OZ mutually at right angles to one another, the point is referred to the three planes through these axes. Here z or PN is its distance above the plane YOX ; y or NM is its distance from the plane XOZ ; and x or OM is its distance from the plane ZOY . In three dimensions, as in two, the problem may be stated to be: Given the law of the motion of P , to express the law of variation of its coördinate; the algebraic expression of the latter law is the equation of the surface traced by the point in moving over all the space it can traverse consistently with the law of its motion. Thus, the equation of a sphere referred to its centre O is $x^2 + y^2 + z^2 = r^2$. As in plane geometry, if the axes are taken oblique to one other, the coördinates are called oblique coördinates. Likewise, the polar coördinates in space corresponding to the polar coördinates in a plane are ρ, θ, ϕ . In the above figure $\rho = OP$, the distance from the origin; $\theta = \angle POZ$, the angle between OP and OZ , and $\phi = \angle XON$, the angle between planes XOZ and POZ . As in plane geometry there are intercept equations for straight lines, so in solid geometry there are intercept equations for planes. And as certain equations of plane geometry are made homogeneous by the introduction of a third coördinate, so in solid geometry certain equations are made homogeneous by the introduction of a fourth coördinate. Thus, in tetrahedral or barycentric four-plane coördinates, the four faces of a tetrahedron (q.v.) of reference are taken as the coördinate planes. The equation of any plane in this system is $lx + my + nz + rw = 0$, in which

$$l : m : n : r = \frac{x_1}{p_1} : \frac{y_1}{p_2} : \frac{z_1}{p_3} : \frac{w_1}{p_4}, \quad x_1, y_1, z_1, w_1$$

being the perpendiculars upon the plane from the vertices A, B, C, D of the tetrahedron of reference, and p_1, p_2, p_3, p_4 the altitudes of the tetrahedron from A, B, C, D respectively. For the coördinate systems for space of n -dimensions, and for the transformations from one sys-

tem into another, it will be necessary to refer to special works on the subject. Consult: Carr, *Synopsis of Pure Mathematics* (London, 1886); Lamé, *Leçons sur les coordonnées curvilignes* (Paris, 1859); Möbius, "Der barycentrische Calcul" (1827), in his *Gesammelte Werke*, vol. i. (Leipzig, 1885); Townsend, *Modern Geometry of the Point, Line, and Circle* (Dublin, 1863-65); Scott, *An Introductory Account of Certain Modern Ideas and Methods in Plane Geometry* (New York, 1894); Clebsch, *Vorlesungen über Geometrie* (Leipzig, 1876-91).

COORG, *kōrg*, or *KĪRG*. A province of British India, on the southwest of Mysore. Area, 1583 square miles. Population, in 1891, 173,055; in 1901, 180,460. It was a native principality of ampler dimensions before 1834, in which year it was annexed by Great Britain. Nearly the whole of the region is covered with forests, more or less dense. Especially notable are the ancient artificial fortifications. The country is intersected by ramparts, which are from 15 to 25 feet in height, and by ditches of about 10 feet in depth and about 8 in width; while, being in some places double or triple, or even quadruple, they measure in aggregate length upward of 500 miles. Capital, Merkara.

COORNHERT, *kōrn'hērt*, or **CORNHERT**, DIRK VOLCKERTSZOON (1522-90). A Dutch scholar and poet, born in Amsterdam. He lived in Haarlem from about 1542, supporting himself by his skill in engraving. In 1561 he became notary, and in 1562 secretary to the municipality also. Most active as a champion of political and religious liberty, he incurred the disapproval of the Spanish Government, was imprisoned in 1567, and afterwards took refuge at Cleves and Xanten. When the States threw off the Spanish yoke in 1572, he was recalled and made secretary to the States of Holland, in which capacity he rendered important services to William of Orange. He was a famous theologian, stoutly opposed the orthodox Protestant party, and by his writings aided materially in preparing the classical period of the literature of the Netherlands. His poetical works include *Abrahams uytgang* (The Death of Abraham) and *Comedie van de blinde van Jericho* (Comedy of the Blind Man of Jericho). Of his works in prose, the *Zedekunst, dat is wellevens kunst* (Ethics: that is, the Art of Right Living), which appeared in 1586, deserves special mention.

COOSA, *kōō'sā*. A river formed by the confluence of the Etowah and Oostanaula rivers in Floyd County in northwestern Georgia (Map: Alabama, C 2). It flows southwest and enters Alabama, where it flows between the hills of the southern extremity of the Appalachian range and is joined by the Tallapoosa River to form the Alabama River just above Montgomery. The Coosa is about 335 miles long, is navigable in the lower part of its course, and drains an area of 10,000 square miles.

COOS (*kōōs*) **BAY**. An arm of the Pacific Ocean in about latitude 43° 45' N., in Coos County, Ore., about one mile wide and 15 miles long, a safe ship harbor, having a depth of 14 feet of water on its bar at high tide. On its south shores are two important manufacturing and coal-mining cities, Empire City and Marshfield. It receives the Coos River.

COOSHIE (native name) **ANT**. A South American leaf-cutting ant (*Ecodoma cephalotes*). See SAUBA ANT.

COO'SY. See KUSI.

COOT (probably from Welsh *crota*, Corn. *cut*, Ir., Gael. *cutach*, bob-tailed). A kind of rail or 'mud-hen' (*Fulica*), distinguished from other rails (q.v.) chiefly in having the toes edged with a scalloped membrane. Coots have a strong, straight bill, the base of which extends up the forehead, and there dilates so as to form a remarkable naked patch. The color is generally dark with more or less white, and the length is about 15 inches. Coots are aquatic in their habits, preferring lakes, or pools with reedy margins, and retreating among the reeds on any alarm. The American coot (*Fulica Americana*) is found breeding throughout all North America, and is migratory in the north, but resident in the south. It is dark-slate color, deepening on the head and neck, and the crissum is white. The nest is a hollow heap of broken, dead reeds: the eggs (see Colored Plate of EGGS OF WATER AND GAME BIRDS) are usually about a dozen in number, clear clay color, dotted with dark brown. The young are covered with black down, striped with bright orange-red. See Plate of RAILS, ETC.

The common coot (*Fulica atra*) of the Old World is found in most parts of Europe, Asia, and the north of Africa. It is about 16 inches long, black, with a narrow white bar across the wings, and the naked patch on the forehead pure white, on account of which it is often called 'bald' coot. The crissum is not white, and this is the most important difference between it and its American cousin. It makes a large nest of water-plants among reeds or rushes. Although not very highly esteemed for the table, the circumstance that many can be killed by a single shot, on the mud-banks to which coots resort in winter, as on the south coast of England, makes coot-shooting profitable to market gunners. Other species inhabit eastern Asia, Africa, and South America. The name 'coot' is very often incorrectly applied in the United States to certain ducks, which are properly known as scoters (q.v.).

COOTE, Sir EYRE (1726-83). An English general, born at Ash Hill, County Limerick, Ireland. He joined the first regiment sent to India, and took a conspicuous part in the capture of Calcutta. It was by his advice that Clive decided on the immediate and vigorous action which culminated in his victory over Siraj-ud-Daula at Plassey in 1757. On January 22, 1760, he achieved a victory over Lally at Wandewash, which destroyed the power and prestige of France in India. Appointed commander-in-chief of the Indian forces in 1779, he began, in 1781, his celebrated campaign against Hyder Ali, whom he finally vanquished at Porto Novo, thus saving Madras to the English. He died on shipboard while on his way from Calcutta to Madras.

COCTER. A name in the southern United States for the Carolina box-tortoise. See TURTLE.

COPAIBA, *kō-pā'ba* (Sp. and Port., from Brazil. *cupaiba*), or **COPAIVA**. A valuable medicinal substance, consisting chiefly of a resin (resin of copaiba), and a volatile oil (oil of copaiba). It flows from incisions made in the stems of trees of the genus *Copaifera*, such as

Copaifera Langsdorffii and others, natives of the tropical parts of America. Copaiba has a peculiar, not disagreeable odor, and an acrid taste. It is diuretic, when taken in small doses; large doses cause gastro-intestinal and renal irritation, and the administration of even a small quantity may give rise to an eruption somewhat like that of measles. It is principally useful from its powerful stimulating action on the mucous membranes. It is much used in affections of the genito-urinary system, during the subacute or chronic stages; and is also employed in chronic catarrhs, etc. The medicinal dose of the balsam is from $\frac{1}{4}$ to 1 fluid drachm. Balsam of copaiba is not infrequently adulterated with castor-oil. The wood-oil, Gurgina or Gurjum balsam of India, the produce of a species of *Dipterocarpaceae*, is sometimes sold as balsam of copaiba. See GURJUN BALSAM.

- COPÄIS (kō-pā'is) LAKE. See BEOTIA.

CO'PAL (Mex. *copalli*, resin). A resinous mineral substance of vegetable origin, chiefly used in the manufacture of varnishes and lacquers. The hardest varieties are used like amber, for making various objects. It appears in commerce in smooth rounded masses, colorless or lemon-yellow, translucent or transparent, rather brittle, fusible at a somewhat elevated temperature, and but sparingly soluble in oil of turpentine. In making varnishes, copal is first rendered soluble; for this purpose it is melted, and, on cooling, reduced to a powder and exposed for some time to the action of atmospheric air. It is then boiled with linseed oil and oil of turpentine, and the resulting solution is filtered. A number of different pale-yellow or almost colorless varnishes are obtained by slightly modifying this process and changing the relative quantities of the ingredients. Copal is found in many parts of the globe; it is dug in Zanzibar and Mozambique, at several places in western Africa, in New Caledonia, and New Zealand, in East India, Brazil, etc. The varieties brought from Zanzibar and Mozambique are noted for their hardness, and have therefore the highest market value; they are supposed to have been produced by trees like the *Trachylobium Hornemannianum* and *Trachylobium Mosambicense*. The copal dug in New Zealand and New Caledonia is known in commerce as *courie* and *dammar*; it is the semi-fossil resin of the *Dammara australis* and *Dammara ovata*, trees still abundantly growing in those countries; the natives of New Zealand chew the resin when freshly exuded by the trees. *Anime* (q.v.) is another variety of copal; in England, however, the name anime is applied to all the different varieties of copal. A mineral substance resembling copal, and known as *fossil copal*, is found at Highgate, near London.

COPALCHE or **COPALCHI** (kō-pāl'ehé) **BARK**. A name given to the bark of two species of *Croton*, natives of Mexico. One, the product of *Croton pseudochina*, reaches the market in small, slender, ash-colored quills which resemble a light variety of cinchona, for which they may easily be mistaken, but have a taste and an odor, especially when burned, which suggest cascarrilla (*Croton eleuteria*), to which the tree is allied; the other in large quills, presumably derived from *Croton suberosus*, which is very bitter and yields an aromatic odor upon burning. The

barks are credited with tonic, aromatic properties, and have been used, particularly in Mexico, in intermittent fevers, and in cases which seemed to demand a mild bitter. The barks have been sold for quebracho.

COPALM, kō-pām'. See LIQUIDAMBAR.

COPAN, kō-pān'. An ancient ruined city of Honduras; one of the most imposing monuments of aboriginal American culture. The buildings are of stone carved with symbolic designs. Good collections of the sculptures made by Saville and others are in the American Museum of Natural History (New York) and other American museums. The city was a native stronghold, and was captured by Hernando de Chavez in 1530. See ARCHITECTURE, AMERICAN.

COPAR'CENARY (from *co-* + *parcenary*, from OF. *parcenerie*, from *parcenier*, partner, from ML. *partionarius*, having a share, from Lat. *partitio*, share, from *pars*, portion). An estate in England originating in descent to two or more persons, called thence coparceners or parceners. It generally arises under the rule of law which makes the daughters of one dying without male heirs inherit equally, but it may also arise by local custom, as in the case of gavelkind, where all the sons inherit equally. Although the property remains unsevered, yet each parcener is entitled to a distinct share of it, and consequently there is no benefit of survivorship, but the right of each descends to his or her heirs, who are still called coparceners with the surviving original parceners. The rule of descent is also *per stirpes*, so that the heirs of one who has predeceased the common ancestor take only the share which would have come to their immediate ancestor had he or she survived, and thus in England a grandson of the common ancestor will also exclude his own sisters. If one of the coparceners alienates his share, the coparcenary is destroyed, and the estate becomes a tenancy in common (q.v.). It may also be destroyed by partition, when the estates become in severalty. This may be effected either by voluntary agreement, or by a suit in chancery. Such parts of the property as cannot be divided (such as the manor-house, etc.) pass to the eldest sister or her issue, but an equivalent in value is assigned to the remaining sisters. If the estates in coparcenary are by descent reunited in one person, they become again an estate in severalty.

In the United States, where descent is to all the children or to all of a group of heirs equally, without distinction of age or sex, coparcenary was from the beginning a common form of joint ownership of land. At the present time such descendants are usually declared by statute to take the land as tenants in common. See COMMON, TENANCY IN; JOINT TENANCY; DESCENT.

COPE. See COSTUME, ECCLESIASTICAL.

COPE. A custom or tribute due to the Crown, or lord of the soil, out of the lead-mines in Derbyshire, England.

COPE, CHARLES WEST (1811-90). An English historical and portrait painter. He was born in Leeds, July 28, 1811, and received his first instruction in art from his father, who was a landscape painter. He also became a pupil of the Royal Academy, and after two years of study in Italy was made a member of that institution in 1848, and professor of the Academy in 1887.

As an historical painter he is represented in the Houses of Parliament by fresco painting, representing the "Burial of Charles I.," "Embarkation of the Pilgrim Fathers," and other subjects. He treated Shakespearean themes in the "Taming of the Shrew" (1874) and "Anne Page and Slender" (1875). Among his earlier works are "The Cotter's Saturday Night" and "The Poor-Law Guardian." As an etcher he was highly regarded by Hamerton, and was one of the original members of the Etching Club. He was also a trustee of the Royal Academy. Cope died August 21, 1890. Consult *Reminiscences of C. W. Cope* (London, 1891).

COPE, EDWARD DRINKER (1840-97). An American naturalist, born in Philadelphia. He received his earliest training in private schools, and then studied anatomy at the University of Pennsylvania. From 1864 to 1867 he was professor of the natural sciences at Haverford College, Pennsylvania. On the death of Leidy, in 1891, he was made professor of geology and paleontology at the University of Pennsylvania, where he was also professor of zoology and comparative anatomy: from 1878 until his death he was editor of the *American Naturalist*. He was geologist and paleontologist of the survey of the region west of the 100th meridian under Capt. G. M. Wheeler, and also of the survey of the Territories under Dr. F. V. Hayden. He made an immense collection of fossils which he described in his various reports, usually published by the Government. His most important contributions were to the history of extinct vertebrates. Scarcely less important were his investigations of the herpetology and ichthyology of North America. In these fields (and especially in the former) his work was epoch-making and laid the foundation for the modern classification of North American reptiles, amphibians, and fishes. Cope's contributions to science number about 400. The most important are: *Systematic Arrangement of Lacertilia and Ophidia* (1864); *Systematic Arrangement of Extinct Batrachia, Reptilia, and Aves of North America* (1869-70); *Systematic Relations of the Fishes* (1871); *Cretaceous Vertebrates of the West* (1877); *Tertiary Vertebrates* (1885); *The Batrachia of North America* (1889); *The Crocodilians, Lizards, and Snakes of North America* (1898). Cope was deeply interested in the questions relating to the subject of evolution. He was the leader of the school of American evolutionists, teaching Neo-Lamarckism (q.v.), which considers the changes and variations wrought in the organism by the immediate influence of environment and the inheritance of such variations by the offspring as the most important factors of organic evolution. His most important works on evolution are: *Origin of Genera* (1868); *Origin of the Fittest* (1886); *Primary Factors of Organic Evolution* (1896).

COPE, SIR JOHN (? -1760). An English general, known through his ignominious defeat at Prestonpans (q.v.) by the Highlanders, under Prince Charles Edward Stuart, September 21, 1745, and perhaps more widely through the sarcastic Jacobite song, based on the event, "Hey, Johnny Cope! are ye wankin yet?"

COPE, THOMAS PYM (1768-1854). An American merchant. He started at Philadelphia the first line of sailing vessels between that city and

Liverpool, and made a large fortune during the War of 1812 by taking all the marine risks on his vessels, which were singularly fortunate in their voyages. He was largely instrumental in introducing the Schuylkill water into Philadelphia, in the completion of the Chesapeake and Delaware Canal, the construction of the Pennsylvania Railroad, and the foundation of the Mercantile Library of Philadelphia. In 1807 he was elected to the State Legislature.

COPEK (Russ. *kopicika, kopeika*, from *kopati*, OChurch Slav. *kopati*, to dig). A Russian coin, the oldest kind in Russia, and the first substitute for furs as a medium of exchange. It is worth one-hundredth of a silver ruble or about half a cent.

COPENHAGEN (Dan. *Kjöbenhavn*, Merchants' Haven, from *kjöbc*, Ger. *kaufen*, to buy + *havn*, Ger. *Hafen*, haven). The capital and largest city of Denmark, situated on the islands of Zealand and Amager, in latitude 55° 41' N., and longitude 12° 35' E. (Map: Denmark, P 3). The Kalvebod Straud, an inlet of the sound separating the two islands of Zealand and Amager, forms the excellent harbor of the city.

Copenhagen is divided into six parts, of which that lying within the former fortifications (now converted into boulevards) forms the nucleus of the city. The quarter situated on the island of Amager is called Christianshavn. The centre of the city is marked by the Kongens Nytorv (New King's Market Place), an irregular square with an equestrian statue of Christian V. From this square issue the principal streets, the finest of which is Bredgade, leading to the esplanade of the citadel. The National Theatre and some of the more important commercial buildings are on this square. The most interesting of the numerous churches of Copenhagen are the Vor Frue Kirke, the metropolitan cathedral, famous for its statues of Christ and the Twelve Apostles, and of a kneeling angel holding a shell for a font, designed and partly executed by Thorwaldsen; the Holmen's Kirke, built in the seventeenth century, and containing monuments to the naval heroes, Juel and Tordenskjöld; Trinitatis Kirke, with a high round tower; the Vor Frelsers Kirke (Church of Our Redeemer), with a winding staircase outside leading to the tower; and the handsome Frederiks Kirke, begun in 1749 and completed in 1894, its fine dome being one of the most conspicuous objects of the city. Christiansborg, the King's residence and a noted palace, was destroyed by fire in 1884. The royal abode was then removed to Amalienborg, a palace made up of four palaces built in the style of Louis XV. The Rosenborg palace, built in the Renaissance style at the beginning of the seventeenth century, contains a remarkable collection of jewels, weapons, and regalia. The palace of Charlottenborg, situated on Kongens Nytorv, is now the seat of the Royal Academy of Art. Other notable public buildings are the Exchange, erected in 1619-40 in the Dutch Renaissance style; the handsome Royal Theatre; the University; the new city hall; the Glyptothek, containing one of the choicest collections of sculpture and other objects of art in Northern Europe; and the new Art Museum, with the Royal Picture Gallery, which ranks high among the minor collections of paintings, including choice specimens of the Dutch and Italian schools, and by modern Danish

masters. The picture gallery of Count Moltke is also quite noteworthy; but above all the world-renowned Thorwaldsen Museum is of the highest artistic interest, comprising an extensive collection of that great sculptor's works and numerous other objects of art, ancient and modern, left by him to his native city. The museum also contains Thorwaldsen's grave.

The University of Copenhagen (q.v.) occupies a distinguished place among European institutions of learning. Other prominent educational institutions are the polytechnic institute affiliated with the university, the veterinary school, founded in 1773, the military and naval schools, and the Academy of Arts. Copenhagen has a number of scientific and art associations, the most prominent of which are the Royal Scientific Society, founded in 1742, and the Royal Northern Antiquarian Society, founded in 1825. The Royal Library contains upward of 500,000 volumes and about 20,000 MSS., and the National Museum, situated in the so-called Palace of the Princes, comprises the Danish and the Ethnographical collections as well as collections of antiquities, coins, medals, and engravings.

The city is administered by a board of magistrates, including the president, appointed by the King, and a municipal council of thirty-six members.

The chief manufactures of Copenhagen include sugar, machinery, textiles, and porcelain-ware. Ship-building is carried on extensively. Over one-half of the commerce of Denmark passes through Copenhagen, and the chief financial institutions of the country are situated here. There is regular steam communication between Copenhagen and ports of Germany, Russia, England, France, and the United States. It is the seat of a United States consul. The population increased considerably during the last decades of the nineteenth century, partly owing to the annexation of adjacent suburbs. In 1880, the population was 234,580; in 1890, 312,859; and in 1901, 378,235.

Copenhagen was a fishing village until the middle of the twelfth century; it began to grow in importance after coming into the possession of Bishop Absalon, who fortified it in 1167. Owing to its good harbor, Copenhagen soon became a place of commercial importance and received from the Bishop of Roskilde municipal rights about the middle of the thirteenth century. It was repeatedly attacked by the Hanseatic towns. It was chosen for the capital of the kingdom in 1443 by King Christopher, the Bavarian. During 1658-59 it withstood a severe siege by the Swedes under Charles X., by its resistance probably saving the Danish monarchy. In 1700 it was bombarded by the united fleets of England, Holland, and Sweden. It suffered heavily from conflagrations during the eighteenth century. In 1801 the harbor of Copenhagen was the scene of the destruction of the Danish fleet by Nelson, and in 1807 the city was subjected to a bombardment by the British, during which the university and a number of public buildings were destroyed. Consult: *Copenhagen, the Capital of Denmark* (Copenhagen, 1898); Seelig, *Führer durch Kopenhagen* (Hamburg, 1895).

COPENHAGEN, UNIVERSITY OF. The only university in Denmark, and the oldest and one of the most famous in Northern Europe. It was founded by Christian I., in 1478, taking its

statutes as well as some of its teachers from the University of Cologne, which, up to that time, had been the chief resort of Danish students. This first foundation perished during the civil wars accompanying the Reformation, but was reestablished in 1539 by Christian III., as a Protestant university, on the model of Wittenberg, then at the zenith of its influence. This foundation, destroyed by fire in 1728, was reestablished in 1732 by Christian VI., and reorganized on its present basis in 1788. Among the distinguished men who have shed lustre on the university are Holberg, in the first half of the eighteenth century, and Oehlenschläger, the poet, Madvig, the classical scholar, Rask, the philologist, Oersted, the physicist, and Worsaae, the archaeologist, in the first half of the nineteenth century. Supported partly by the State and partly by endowment, the university had, in 1902, some 2000 students, a library of 300,000 volumes, museums, an academy of surgery, and an observatory. Instruction is gratuitous, and the courses are open to both sexes. The university has five faculties. Attached to it are botanical and zoological gardens.

CÖPENICK or **KÖPENICK**, kē'pe-nik. A town in the Prussian Province of Brandenburg, situated at the confluence of the Dahme and the Spree, 10 miles southeast of Berlin. It contains a royal palace dating from the sixteenth century, now used as a seminary for teachers, and a seventeenth-century Rathaus. The chief manufactures include glass, linoleum, starch, sugar, chicory, shoddy, and trimmed lumber. Population, in 1890, 14,619; 1900, 21,024. The city is mentioned in 1157, as the residence of the Slavic prince Jaczo. It was conquered by the Margrave of Brandenburg in 1240, and plundered by the Russians in 1760.

COPEPODA (Neo-Lat. nom. pl., from Gk. κόπη, *kōpē*, oar + πούς, *pous*, foot). A large and important order of entomostracous crustaceans, characterized by having the five pairs of feet specially adapted for swimming. There are no branchial sacs on the feet and there is never any bivalve shell. The copepods, sometimes called 'water-fleas,' live in both salt and fresh water in swarms. Some species are parasitic on fish and sometimes do great damage in that way, but most copepods are free-swimming, and feed on organic matter in the water. They thus act as scavengers and must be of great importance in keeping harbors clean. Moreover, they serve as food for many species of food-fishes. Among our freshwater species, those of the genus *Cyclops* are perhaps the best known. They are very minute, actively moving creatures. The genus *Argulus* is parasitic on carp, suckers, and other fish. They reach a considerable size, frequently half an inch in length. Consult publications of United States Fish Commission and National Museum; and Herrick and Turner, *Synopsis Entomostraca of Minnesota* (Saint Paul, 1895). For further information see the articles CRUSTACEA; ENTOMOSTRACA.

COPERNICAN SYSTEM. The system which represents the sun to be at rest and the earth and planets to move round it; in other words, that which we now know, on unquestionable evidence, to be the true system of astronomy. (See PTOLEMAIC SYSTEM.) It has its name from Copernicus, but, in point of fact, it may



COPERNICUS
FROM THE PAINTING BY OTTO BRAUSEWETTER

be described as being a growth to which he was only one of many contributors. The merit of having first formed the general notion of the system seems to be due to Pythagoras; Copernicus has the credit of having, after the lapse of centuries, again drawn the attention of philosophers to it, and of having greatly increased the probability of its truth by his calculations and arguments: for the rest, the glory of having matured the idea belongs to Kepler, Galileo, and Newton, who, through the discovery of the law of gravitation, finally demonstrated its truth effectually. Many who have been used to reverence the name of Copernicus in connection with this system would be surprised to find, on perusing his work, *De Revolutionibus Orbium*, how much of error, unsound reasoning, and happy conjecture combined to secure for him in all times the association of the system with his name.

De Revolutionibus Orbium, dedicated to Pope Paul III., consists of six books, in which Copernicus undertook to demonstrate his whole system. The character of the reasoning which then passed for demonstration must be borne in mind in judging of the author's procedure in establishing his various positions. It was then thought a sufficient demonstration of a phenomenon to make a supposition, on which its occurrence would be intelligible, without attempting to bring the supposition itself, by an induction of facts, within the truth of nature; many abstract propositions, too, which would now appear to be simply silly, were at that time universally admitted to be of great weight in scientific arguments.

Illustrations of both of these peculiarities may be gleaned from the first of the six books of *De Revolutionibus*. It contains the following propositions: (1) That the universe is spherical. This is established by such arguments as that the sphere is the most perfect figure, etc. (2) That the earth is spherical, which flows from the same kind of considerations. (3) That the earth and sea make one globe. (4) That the motions of all the heavenly bodies must be uniform and circular, or compounded of uniform and circular motions. Here, again, we meet with singular reasons. A *simple* body must move circularly, and nothing but circular motion could give periodicity to phenomena. (5) That, supposing the distance of the stars to be immense, there is no reason why the earth should not have a motion round its axis as well as a motion in its orbit. (6) That the sphere of the stars is immensely distant. (7 and 8) The ancients were wrong in placing the earth at the centre of the universe. The arguments under this head are as imaginary as those which they were designed to refute. The falling of a body to the earth is deduced from the assumption that it is only given to wholes to move circularly, while it is of the nature of parts, separated from their wholes, to move in straight lines. That there must be a *centrum mundi*, an entity not recognized by modern science, is admitted, the question being as to its position. (9) It is possible for the earth to have several motions. (10) Copernicus establishes the order of the planets, and draws a diagram of the system much as it is now represented. It may be observed that, following the old systems, such as the Ptolemaic, he lays down a *sphere* for the fixed stars. See FIRMAMENT.

The most brilliant and valuable part of the *De Revolutionibus* is that in which he explained, for the first time, the variations of the seasons, the precession of the equinoxes, and the stations and retrogradations of the planets. In general, his explanations are right, and perfect as to the general nature of the causes of the phenomena. But Copernicus had neither mathematical nor mechanical knowledge sufficient to enable him to explain more than the mean motions of the solar system. To account for irregularities, he was obliged to introduce a system of epicycles entirely resembling that of Ptolemy. (See PTOLEMAIC SYSTEM.) This arose from the false notion of his time that all motions must be compounded of circular ones, with the application of which idea, and with the invention of convenient epicycles, the greater part of the *De Revolutionibus* is occupied. It may further be added, to rectify the vulgar notion regarding the relation of Copernicus to the system of the heavens, that he had no answer to offer to the mechanical objections to his system. Most of them, indeed, were such as could not possibly be met by the mechanical knowledge of the time. One of the commonest was that against the axial motion of the earth, that it was inconsistent with the fact of bodies falling to the points of the earth directly beneath the points from which they are dropped; for this he had no answer, nor could he have, the laws of motion being not yet discovered.

COPERNICIA, kō'pēr-nish'ī-ā. See CARNAUBA PALM.

COPERNICUS (Latinized form of *Koppernick*), NICHOLAS (1473-1543). A celebrated German astronomer, born at Thorn, a Prussian town on the Vistula, at that time belonging to Poland. He was instructed in the Latin and Greek languages at home; in 1491 he was sent to the University of Cracow, where he studied mathematics and other sciences. In 1495 he went to Italy and spent some years in the study of law, astronomy, and medicine, in Bologna and Padua. His natural bent, however, was toward mathematics, the study of which he pursued with passion through all its branches.

Having become enamored of the study of astronomy, he projected a journey to Rome in his enthusiastic admiration of Regiomontanus, who resided there and was then the most illustrious of the astronomers. On his arrival, in 1500, he was kindly received by Regiomontanus. Here his reputation, and the favor of his distinguished friend, led to his being chosen professor of mathematics. He became doctor decretorum at Ferrara in 1503, and in 1505 returned to his native country, where, having entered into holy orders, he obtained through his uncle, the Bishop of Ermeland, a canonry at Frauenburg, in the enjoyment of which he passed the rest of his life. His working day, it is said, he divided into three parts—one devoted to the duties of his office, another to giving medical advice gratuitously to the poor, and the third to study.

Soon after his return to Prussia, he began, in his thirty-fifth year (1507), to apply his fund of observations and mathematical knowledge to correcting the system of astronomy which then prevailed. The result was his *De Revolutionibus Orbium*, a brief account of which is given under COPERNICAN SYSTEM. He completed it in 1530, in his fifty-seventh year. Twelve years, however,

elapsed before he could be persuaded to give his book to the world. Perhaps the strongest motive for his reticence was the fear of the unpopularity which the work threatened to bring him; for many who had heard of the views it advocated doubted if these were in harmony with Scripture. At all events, it is pretty certain that it was his desire to conciliate the Church that led him to dedicate his book, when it was published, to Pope Paul III. By the time the book was actually printed, however, the author was beyond the power of the Church. An attack of dysentery, followed by paralysis of the right side, had destroyed his memory and obscured his understanding, and he is said to have died a few hours after a copy of the labor of his life reached him.

Besides the *De Revolutionibus*, may be mentioned among Copernicus's works a treatise on trigonometry, entitled *De Latribus et Angulis Triangulorum* (Ermeland, 1542); and *Theophylactici Scholastici Simocattæ Epistolæ Morales, Rurales, et Amatoricæ, cum Versione Latina*. He also wrote a work on money, and several MS. treatises from his pen are in the library of the bishopric of Ermeland.

COPHET'UA. An African king who loved and married a beggar maiden, Penelophon. The story is told in a ballad contained in Percy's *Reliques*, and is alluded to in various plays of Shakespeare, and by other writers. Tennyson's *Beggar Maid* gives the legend in modern form.

COPIAPÓ, kō'pyá-pō' (So. Amer. *Copayapu*). The capital of the Province of Atacama, Chile, situated on the Copiapó, 50 miles by rail from its port, Caldera (Map: Chile, C 9). It is regularly laid out and possesses a fine parish church, a bronze statue of Juan Godoy, the discoverer of the Chañareillo silver-mines, and also a provincial high school, a mining-school, and a public library. The town is the centre of a productive mining district and contains machine-shops and smelting-works. Population, in 1895, 9301.

COPING, kōp'ing (from *cope*, variant of *cape*, from Lat. *capa*, cape). The upper or covering course or cop of a wall, generally either overhanging or sloping or rounded, so as to shed the water. It can be of stone, brick, or terra-cotta. In the Middle Ages, where the coping was of heavy stone, it was often ornamented with a circular molding along the top, a stepped slope, and a groove under the lower edge.

COPINGER, WALTER ARTHUR (1847—). An English jurist. He served as president of the Bibliographical Society and became professor of law at Owens College and at Victoria University. Among his numerous publications may be mentioned: *Index to Precedents* (1872); *Title Deeds* (1875); *An Essay on the Abolition of Capital Punishment* (1876); *The Law of Rents* (1886); and *Law of Copyright* (3d ed., 1891).

COP'LAND, JAMES (1791-1870). An English physician. He was born at Deerness, studied medicine at Edinburgh, traveled on the Continent, and subsequently undertook a journey to Africa to investigate the nature of epidemic diseases prevalent in tropical lands. He settled in London about 1818 and was made a member of the Royal College of Physicians. In 1822 he undertook the editorship of the *London Medical Repository*; and, being chosen in that year to deliver the annual oration before the London

Medical Association, he advanced in his lecture a new theory of electro-galvanism. His *Outlines of Pathology and Practical Medicine*, in which he especially treated of the ganglionic nerves and their functions, and proposed a new and more simple classification of diseases, appeared in 1822; the *Elements of Physiology* in 1824, and *On Pestilential Cholera* in 1832. But Copland's most important work was the *Dictionary of Practical Medicine* (1833-58), four closely-printed volumes, to which he devoted the labor of many years.

COPLEY, kōp'li, JOHN SINGLETON (1737-1815). An American historical and portrait painter, born in Boston of Irish parents, July 3, 1737. He received instruction in America from Peter Pelham, a portrait painter, advanced rapidly in his profession, and executed numerous portraits in this country. He traveled much on the Continent, but exhibited mainly in London, where he lived after 1775. He was made R.A. in 1783. Of his large historical paintings, "Charles I. Demanding the Five Members from Parliament" is now in the Boston Public Library. His picture "The Death of Major Pier-son" is in the National Gallery, London. In Buckingham Palace is the portrait of three children of George III. His portraits of prominent Americans are held in high esteem by their descendants for their distinction, dignity, and fine coloring. That of Mrs. Thomas Boylston is in the Memorial Hall of Harvard University. Copley died September 9, 1815, and was buried in Croydon Church, near London. He was father of John Singleton Copley, Lord Lyndhurst. Consult: Amory, *Domestic and Artistic Life of J. S. Copley*, R. A. (Boston, 1882); Perkins, *Sketch of the Life of Copley* (Boston, 1873).

COPLEY, JOHN SINGLETON, Lord Lyndhurst (1772-1863). A British lawyer and statesman, four times Lord Chancellor of England. He was the son of J. S. Copley, R.A., and was born in Boston, Mass., May 21, 1772. While yet an infant, his father removed to England for the practice of his art. He was educated at Trinity College, Cambridge, where he was second wrangler and Smith's prizeman in 1794. In 1795-96, as a traveling bachelor and fellow of his college, he visited the United States, and in company with the French author Volney made a tour which he described in Latin letters to the vice-chancellor of his university. Called to the bar at Lincoln's Inn in 1804, he chose the Midland circuit, but did not achieve financial success until 1812, when his defense of a Luddite at Nottingham established his reputation. In politics he was at first a Liberal, and long expressed sentiments hostile to the Ministry of the day. He ably defended Watson and Thistlewood on their trial for high treason in 1817, and obtained their acquittal. In 1818 he entered Parliament; in 1819 he became Solicitor-General in the Liverpool administration and was knighted, and in 1824 he was promoted to the rank of Attorney-General. In 1826 he became Master of the Rolls. When Canning was charged to form a Ministry in 1827, he offered the Great Seal to Sir John Copley, who was raised to the Upper House as Baron Lyndhurst, and remained Lord Chancellor from 1827 to 1830. In 1831 he became Lord Chief Baron of the Exchequer, which office he exchanged for the woolsack during the brief administration of Sir Robert Peel in 1834-35. In 1835 he led the opposi-

tion to the Melbourne Ministry in the Upper House, in speeches of great power and brilliancy. Lyndhurst's orations and annual reviews of the session did much to reanimate the Conservative Party, and pave the way for their return to power in 1841. He then became Lord Chancellor for the third time, and held the Great Seal until the defeat of the Peel Government in 1846. After that time he took little part in home politics; but his voice was often heard on matters of foreign policy, and in denunciation of tyranny in Italy and elsewhere. He died in London, October 12, 1863. Lord Lyndhurst's high attainments as a lawyer have never been questioned, and his judgments have never been excelled for clearness, method, and legal acumen. In the House of Peers he had few equals among his contemporaries as a brilliant orator and debater. He delivered his last speech in Parliament at the age of eighty-eight with his usual force and ability. Consult Martin, *Life of Lord Lyndhurst* (London, 1883).

COPMANHURST, THE CLERK OF. An alias of Friar Tuck in the Robin Hood tales. Sir Walter Scott alludes to him by this title in *Ivanhoe*.

COPPÉE, kó'pá', FRANÇOIS EDOUARD JOACHIM (1842—). A French poet, dramatist, and novelist. He was born in Paris, January 12, 1842, and was a weak, nervous, sentimental boy, son of a clerk in the War Department. His mother died in his childhood, his father in his youth. He obtained a Government clerkship, but the sadness and trials of early days left deep impress on his later work. Moments that he could spare from office labors were given to poetry, but he first attracted notice by a one-act play, *Le passant* (1869). In the Franco-German War he served in the militia. He had already published three volumes of verse, *Le reliquaire* (1866); *Les intimités* (1868); and *Poèmes modernes* (1869), but first caught the popular ear after the experiences and disasters of the war had prepared him and his public for *Les humbles* (1872). The next six years brought each its volume of verse, *Le cahier rouge*; *Olivier*; *Une idylle pendant le siège*; *L'exilée*; *Les mois*; *Le naufragé*. During all this period he had been producing dramas, collected in four volumes (1873-86). Of these the more noteworthy are *Le luthier de Crémone* (1877) and *Pour la couronne* (1891). His prose tales date chiefly from the eighties. Of these, the best are *Fille de tristesse*; *Henriette*; *Madame Nunu*; and *Le coucher de soleil*. He has told his own story in the essentially autobiographical *Toute une jeunesse* (1890). There is also a series of journalistic essays, *Mon franc parler* (1894). Coppée best deserves study as a poet, for it is the poetic element in his stories and dramas that gives them their charm. He was at first and by instinct an artist in verse, a skilled craftsman, though, perhaps, a little affected; after 1870 his facile suavity yielded to sterner notes in the lyric of democracy, of work, poverty, and self-denial, and of the indignant patriotism of defeat. To this succeeds the gentle idyllic vein with an occasional tragic touch. But whether in prose or verse, he continues the poet of the Parisian workman and the petty trading class. He has happily described himself as "a man of refinement who enjoys simple people, an aris-

toocrat who loves the masses." Consult Lescure, *Coppée, l'homme, la vie et l'œuvre* (Paris, 1888).

COPPÉE, HENRY (1821-95). An American educator and author, born in Savannah, Ga. He graduated at West Point in 1845; served in the Mexican War, and was assistant professor at the Military Academy from 1850 to 1855, when he became professor of English literature and history in the University of Pennsylvania. Here he remained for eleven years, after which he was president of Lehigh University until 1875, and a professor there till his death. In 1874 he was appointed a regent of the Smithsonian Institution. Among his publications were: *Elements of Logic* (1857); *Gallery of Famous Poets* (1858); *Gallery of Distinguished Poetesses* (1860); and *The Conquest of Spain by the Arab-Moors* (1881). He edited two volumes of the Comte de Paris's *Civil War in America* (1876).

COPPER. A metallic element known to the ancients. It is mentioned in the Bible, although the term there used is believed to include also brass and bronze. The prehistoric inhabitants of North America worked the native copper deposits of the Lake Superior region. Specimens of metal-work of pure copper have been excavated at the ruins of Troy. Deposits of copper ore on the island of Cyprus were early mined and smelted by the Greeks, and, according to Homer, the combatants in the Trojan War had no other armor than that made of bronze, which is a mixture of copper, tin, and zinc. The Romans learned of it from the deposits in Cyprus, and it was originally called by them *es cyprium*, Cyprian brass, a term which was subsequently shortened into *cyprium*, and then *cuprum*. It was regarded as the metal specially sacred to Venus, and in the writings of alchemists it is designated by the symbol known as the *looking-glass* of that goddess. Paracelsus and other early chemists believed that when iron precipitates metallic copper from solutions of its salts, a transmutation of iron into copper takes place, and it was not until the seventeenth century that chemists recognized the elementary character of copper. Copper is found, either native or combined, in the following minerals: *cuprite* (the red oxide); *tenorite* (the black oxide); *chalcocite* (sulphide); *malachite* (the green copper carbonate); *azurite* (the blue copper carbonate); *chalcocopyrite* (copper and iron sulphide); *bornite* (black copper and iron sulphide). In addition to these, copper is found in many minerals of a more complex composition, such as *atacamite*, *bourbonite*, *enargite*, *tetrahedrite*, etc. It is also found in sea-water and in mineral waters, in seaweed, in the blood of various animals, in eggs, in flowers, in plants that live in soil containing copper, etc. Minerals containing copper have a wide distribution, but the chief sources of the world's supply are the United States, Spain, Germany, Japan, Australia, Mexico, and Chile. Among these countries which together are responsible for 90 per cent. of the output, the United States stands far in the lead, contributing at present about 55 per cent., while Spain ranks second with little more than 10 per cent. of the total. The world's production of copper increased from 269,615 long tons in 1890 to 487,993 long tons in 1900. The distribution of the output in the latter year is shown in the

following table compiled for *The Mineral Industry*:

THE WORLD'S PRODUCTION OF COPPER IN 1900.

COUNTRIES	Long Tons	COUNTRIES	Long Tons
Argentina.....	75	Mexico.....	22,119
Australasia.....	23,000	Newfoundland.....	2,883
Austria-Hungary..	1,355	Norway.....	3,935
Bolivia.....	2,100	Russia.....	8,000
Canada.....	8,459	Peru.....	8,220
Cape of G. Hope...	6,720	Spain-Portugal...	52,872
Chile.....	25,604	Sweden.....	450
Germany.....	20,310	Turkey.....	2,304
Italy.....	2,753	United Kingdom...	765
Japau.....	27,840	United States.....	268,229
		Total.....	487,993

Copper-mining has long been carried on in the United States; deposits were worked in Connecticut, New Jersey, and Pennsylvania in the early part of the eighteenth century, and there are records of ore-shipments to England as early as 1731. The beginning of the industry in its present importance, however, may be said to date from the opening of the Lake Superior district in 1844. At this time the output of the whole country was inconsiderable, but increasing steadily as new mines were developed; it reached 10,000 long tons in 1867 and 27,000 tons in 1880. Then, with the extension of railway facilities in the West, the rich deposits of Montana and Arizona became accessible for exploitation and quickly assumed a prominent place in the list of producers. The Lake Superior copper-mining district on the Upper Peninsula of Michigan is remarkable for its unique character as well as for its great commercial importance. The ore is native copper, carrying some silver, but with only small amounts of other impurities. It occurs as a cement, binding together or replacing the pebbles of a conglomerate, as a filling in an amygdaloidal diabase, and as irregular masses in veins. The last-named deposits have yielded immense masses of copper, but, as the veins are irregular and of variable tenor, they cannot be worked at a profit when copper prices are low. The productive mines, at the present time, are located in the conglomerate or in the diabase. These deposits yield an ore averaging from six-tenths to four per cent. copper. With the lower limit, which is reached in the Atlantic mine, the operations must be conducted on a large scale and at a minimum of cost to yield a profit. The

bornite, chalcopyrite, chalcocite, and other sulphides, carrying silver and some gold, occur as fissure veins in granite. Enormous quantities of ore averaging as high as 40 per cent. copper were discovered in some of the mines and resulted in the rapid development of the district. With depth there has been a gradual decrease in values, and the average at the present time is probably less than 5 per cent. The Anaconda Company for several years maintained an output of over 100,000,000 pounds, and still ranks as the largest producer of copper in the world. Next in importance to the Lake Superior and Montana districts are those in Arizona at Bisbee, Clifton, and Globe. The ores, here, are carbonates, oxides, and native copper. Their occurrence is limited to Carboniferous limestone and porphyry. The mining companies have the advantage of working a rich and easily smelted ore, but this is offset by the lack of water as well as of cheap fuel and transportation facilities. Besides the foregoing there are less important districts in California, Colorado, Utah, New Mexico, Tennessee, and Vermont.

The following table, compiled from the statistics of the United States Geological Survey, gives the copper production of the United States by decades, and shows the relative amount of the Lake Superior product:

YEAR	Total production in long tons	Lake Superior	Percentage of Lake Superior product
1845	100	12	12
1855	3,000	2,593	86.4
1865	8,500	6,410	75.4
1875	18,000	16,089	89.4
1885	74,052	32,209	43.5
1895	169,917	57,737	34
1899	253,870	65,803	25.9

Among foreign countries Spain ranks first in the production of copper. Deposits near Huelva, Andalusia, have been worked since Roman times. The ore (pyrites) carries only 2 to 3 per cent. copper, but it occurs in immense deposits and is easily extracted. Chile and Mexico are important copper-producers and give promise of attaining greater prominence in the immediate future.

The great increase in the use of copper in electrical and other industries is shown in the following table, giving, in long tons, the world's production for the decade of 1890-99:

WORLD'S PRODUCTION OF COPPER 1890-1899, ACCORDING TO THE UNITED STATES GEOLOGICAL SURVEY

COUNTRY	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Europe.....	79,952	80,751	84,648	82,922	82,474	83,128	88,216	89,938	87,960	91,105
North America.....	124,711	138,065	166,941	158,553	172,994	187,260	222,524	242,679	261,625	282,636
South America.....	33,960	29,015	29,015	27,320	26,810	24,925	26,340	25,300	30,065	32,730
Africa.....	6,570	6,120	6,120	6,090	6,500	7,115	7,450	7,440	7,110	6,490
Asia.....	11,972	18,500	19,000	18,000	20,050	18,430	21,000	23,000	25,175	27,560
Australasia.....	9,455	10,292	8,785	6,158	6,791	8,573	11,272	16,583	17,043	17,900
Totals.....	266,620	282,743	314,509	299,043	315,619	329,431	376,802	404,940	428,978	458,421

Calumet and Hecla is the richest and largest of the Lake Superior mines. While this district has been an active producer for more than fifty years, it still has a promising future, owing to the favorable conditions for deep mining. The most productive copper-mines of Montana are situated near Butte. The deposits, consisting of

Copper (symbol, Cu; atomic weight, 63.60) is a red-colored metal with a bright, metallic lustre. The specific gravity of finely divided copper is 8.36; that of hammered copper is 8.95. It is very malleable and may be hammered or rolled into thin leaf or drawn into fine wire. Its melting-point is about 1100° C., and it burns

with a green flame. Copper is an excellent conductor of electricity, and hence its extensive application in the form of wire in electric telegraphy. Metallic copper is used for the manufacture of tubular boilers, for the sheathing of ships, for electrolytes, in coinage, and for numerous other purposes. It is also much used in the form of alloys with other metals, its principal alloys including brass, bronze, bell-metal, speculum-metal, aluminum bronze, and German silver. (See ALLOYS.) Copper combines with oxygen to form four oxides, the *quatroxide* or *sub-oxide* (Cu_2O); *cuprous oxide*, *hemioxide*, or *protoxide* (Cu_2O); *cupric oxide*, or *monoxide* (CuO); and the *peroxide* (CuO_2). Of these, the more important are the cuprous and cupric oxides, which form, with acids, series of cuprous and cupric salts. Cuprous oxide is found native as *cuprite*, or red copper ore, and is used in the production of ruby glass; with the black oxide it forms one of the copper paints used for coating the bottoms of ships. Cupric oxide is found native as *tenorite*, or black copper ore, and is used to make green and blue glass, and as a pigment. Other important compounds include: *Cupric hydroxide*, which is used as a blue pigment by paper-stainers, and when dissolved in ammonia is known as *Schweitzer's reagent*, a solvent for various forms of cellulose, as cotton, wool, linen, filter-paper, etc.; *cuprous chloride*, which is used as a pigment under the name of *Brunswick green*; *cupric chloride*, which finds employment in calico-printing, in the manufacture of methyl violet and other colors. *Cupric sulphate*, or blue vitriol, the most important of the copper salts, may be prepared by dissolving metallic copper or its oxides in sulphuric acid; it forms large, transparent, blue crystals which are soluble in water and find extensive employment in calico-printing, in dyeing, in the preparation of pigments, for the preservation of timber, and in agriculture. Another salt, *cupric nitrate*, is used to some extent in dyeing and calico-printing, as is also *cupric sulphide*. *Cupric carbonate*, which occurs native as the green malachite and as the blue azurite, two minerals almost identical in their composition, is used as a pigment. An anhydrous basic carbonate, too, is used as a pigment, especially for paper-staining, under the names of *Bremen blue*, *Bremen green*, *Verditer blue*, and *Verditer green*. Copper oxide, when dissolved in acetic acid, yields the commercial *verdigris*, which is used in the manufacture of pigments, as an oxidizing agent, in the indigo bath, etc. Many of the copper salts are poisonous, and emetics should be promptly given in cases of poisoning. See ANTIDOTES.

METALLURGY. The extraction of copper from its ore consists, first, in the production of crude copper, and, second, in the refining of this crude product. The extraction of crude copper is performed by (1) dry methods; (2) wet methods; (3) electro-metallurgical methods. Copper obtained by the wet or dry methods is called black copper or blister copper, that is, crude copper, and contains a number of foreign substances which interfere with its use in the arts. It must, therefore, be purified or refined, by special processes, which may be either by the dry or electrolytic methods. The most important ores of copper are the sulphuretted compounds, and next come the oxides, carbonates, and silicates of copper, as well as native copper con-

taining impurities. All these ores, when sufficiently rich, are treated by smelting or by the dry method. Wet methods are employed for ores so poor in copper that they cannot be treated profitably by dry methods; ores containing only one-quarter to one per cent. of copper can, under favorable circumstances, be profitably worked by wet methods.

Dry methods of copper-smelting may be classified as follows: Blast-furnace smelting, also known as the German or the Swedish process; reverberatory smelting, also known as the English process; and the converter or Bessemer process, used only in reducing copper mattes. The blast-furnace or German process, consists in roasting the ores in special appliances, followed by smelting the roasted material with coke or charcoal in blast-furnaces. The series of chemical reactions which take place during these operations are rather too technical to be treated here; the result is copper matte, a mixture of copper sub-sulphide and a portion of the original impurities of the ore. This matte is then commonly enriched by partly calcining it and again smelting it in the blast-furnace; this second process is not always employed. The matte direct from the original smelting or from the second enriching process is roasted and then smelted with siliceous fluxes in addition to the carbon which is used in the first smelting to produce coarse or black copper. In the reverberatory process the ore is first partly calcined, and is then smelted in a reverberatory furnace with a quartz lining, with the addition of siliceous materials or ores if necessary. The resulting matte is then concentrated by being partially roasted and then smelted in reverberatory furnaces. The matte resulting from the concentrating process is converted into crude copper by partial roasting followed by fusion in reverberatory furnaces. The converting process is not applied to ores, but is usually employed to reduce to coarse copper the matte produced by either the blast-furnace or the reverberatory process. It consists in blowing a highly subdivided stream of air under pressure through molten matte which is contained in a pear-shaped or cylindrical converter lined with quartz ore material. The matte to be blown is first melted in cupolas and from them run into the converter. Neither the blast-furnace nor the reverberatory process is commonly used in the pure form, but the two are combined in an attempt to unite the advantages of both.

Wet methods of reduction consist in getting into aqueous solution, by means of suitable solvents, the copper, which must necessarily occur in some combination suitable for solution and of precipitating it from these solutions by means of suitable precipitants. The copper precipitate thus obtained is refined in the dry way. The ores from which copper is extracted in the wet way contain it in the form of oxide, carbonate, sulphate, and sulphide. From all these ores, except the sulphide, the copper can be dissolved with sufficient rapidity by the aid of a cheap solvent, and as the more energetic solvents are too costly to be applied on a large scale, sulphide ores are transformed into some form suitable for solution by cheap solvents such as water, hydrochloric acid, sulphuric acid, or solutions of metallic chlorides. To explain the application and action of the different solvents and pre-

ecipitants with different classes of ores would require entering into details of too technical a character. In all cases, however, the copper is brought into solution as a sulphate or a chloride, and precipitated from solution by means of iron as metallic copper, or, in exceptional cases, by other precipitants which produce compounds of copper.

The electro-metallurgical method of extraction is mostly used in separating copper from alloys of copper and the precious metals. The process is as follows: The ingot of alloy is attached to a conductor from one pole of a dynamo and a sheet of copper is connected to the other pole, and both are immersed in acid solution of sulphate of copper. A current is then passed through the solution between the two poles, the effect of which is to dissolve from the ingot the copper and deposit it on the copper plate, leaving the other metal, which falls as mud to the bottom of the tank. Strictly speaking, this is a refining process as applied to alloys rather than an extracting process, but it has been adapted to the extraction of copper from the ore and matte, although it has not been extensively employed for this purpose. This same process can be used for refining coarse copper, but it is too costly a process for simply purification and is seldom used unless the copper is alloyed with gold, silver, or nickel. The usual method of refining coarse copper is to fuse it in a reverberatory furnace, subjecting it to the oxidizing influence of the air, and then to reduce the cuprous oxide formed by stirring the molten mass with a green wood pole. Consult Peters, *Modern Copper Smelting* (New York, 1899).

COPPER, IN SHIP-BUILDING. A ship which has her bottom sheathed with sheet copper is said to be coppered, or copper-bottomed. The copper so used is in sheets measuring about 48 inches by 14, and weighs 18 to 32 ounces per square foot. The copper is always applied over wood to which it is nailed; at ordinary draught, the line of the copper is usually well above water. It seems to keep the bottom free of serious marine growth, which readily attaches itself to wood and less readily to iron. Coppering checks the formation of marine growth in two ways, as a germeicide—the carbonate of copper formed is a deadly poison to animal and vegetable life—and by exfoliation, the film of copper salt peeling off quite readily, carrying with it the attached growths. When cheapness is more desired than strict efficiency, alloys of copper are used for sheathing. Iron and steel ships are coppered by first putting on a thickness or two of wood planking; this is to avoid galvanic action, which may be serious if the hull and copper are connected. The question of coppering men-of-war is one still unsettled. In the United States Navy very few vessels have been coppered, and the Board of Construction in the Navy Department has decided against coppering. A wooden ship is copper-fastened when the bolts used in her under-water body are of copper instead of iron. Iron bolts rust rapidly when exposed to the action of salt water, particularly when merely damp, or wetted and dried alternately. This seriously reduces the strength of the ship. Copper bolts are eaten away much less rapidly.

COPPERAS (ME. *coprose*, from OF., Fr. *couperose*, from ML. *coporosa*, *euperosa*, *cuprosa*,

from Lat. *cupri rosa*, rose of copper). The name given to the commercial ferrous sulphate, and also applied to the native mineral melanterite.

COPPER BUTTERFLY. Any of several small butterflies, so called in reference to their colors. In England collectors apply the name to those of the family Lycaenidae in general. In the United States it is restricted to the closely related forms of the genus *Chrysophanus*, which, however, is found also in the Old World.

COPPERFIELD, DAVID. See DAVID COPPERFIELD.

COPPERHEAD. A venomous North American snake (*Ancistrodon contortrix*) of the rattlesnake family. It may exceed four feet in length, and has a burnished copper-colored head, hazel-brown (sometimes golden) body, with y-shaped dark blotches on the sides, which usually meet over the back. The belly is marked with round black spots. The belly is tapered, greenish when young, chestnut in age, and has no rattle; nor



THE COPPERHEAD.
(Top of head, and face view.)

does the snake vibrate it against the grass, "and so produce a warning sound not unlike that of the rattlesnake," as is often said, more than is the habit of all snakes when excited. Another unfounded fable is that it waits until you pass and then strikes from the rear. The truth is it is sluggish, moving about mainly at night, and by day seeks to avoid notice and will not bite unless greatly alarmed or provoked; most accidents result from picking it up or touching it with the hand in handling brush or stones in the woods, or clearing swamps. Its bite is as deadly as that of any snake of its size, and the absence of rattling makes it especially dangerous. In the fall it seeks some underground den, where occasionally several have been found entangled together in dormancy; these are usually, if not always, pregnant females. When aroused in spring it seeks swamps and wet meadows, where its food (mainly mice) is most abundant, and where the young are brought forth alive in midsummer. This snake is known from Massachusetts to the Rio Grande, especially in mountainous districts, and is still common in the rocky hills of the Hudson and Connecticut valleys. It has many names, such as 'pilot,' 'red-eye,' 'red adder,' 'copper-belly,' and, in the South, 'cotton-mouth' and 'moccasin'—the last confusing it with its near relative, the true or water moccasin (q.v.). Consult Stejneger, "The Poisonous Snakes of North America," in *Ann. Rept. U. S. Nat. Museum* for 1893 (Washington, 1895). See Plate of RATTLESNAKES.

COPPERHEADS. A name given by their political opponents during the Civil War to those Northern men who, believing the conquest of the South impossible—though not necessarily sympathizing with the Southern cause—strenuously objected to the vigorous prosecution of the war by the administration. In some parts of the country the name was uniformly used as synony-

mous with 'Democrats.' The most prominent and most obnoxious of the 'Copperheads' was Clement L. Vallandigham (q.v.). The name was taken from the copperhead snake, which gives no warning before it strikes. It originated in 1862, and quickly came into general use throughout the North.

COPPER INDIGO. A name given to the mineral covellite, especially when found in spheroidal masses of an indigo-blue color, as is the case at various localities in Thuringia and at Vesuvius. Covellite is a copper sulphate.

COPPERMINE RIVER. A river of northern Canada, so named, in common with the mountains to the west of it, from the metallic products of the vicinity. It rises in Point Lake, Mackenzie division, and enters Coronation Gulf, in the Arctic Ocean, about latitude 68° N. and longitude 116° W. (Map: America, North, G. 3). The Coppermine River, throughout its course of over 300 miles, is little better than a series of falls and torrents.

COPPER-NOSED BREAM (so called from the color of the snout). The blue sunfish, or dollardee (*Lepomis pallidus*), of the Mississippi Valley. See SUNFISH; and Plate of DARTERS AND SUNFISH.

COPPER-PLATE ENGRAVING. See ENGRAVING.

COPPER RIVER. A river of Alaska, which rises near Mount Wrangel, flows at first northwest, and then, turning sharply toward the south, maintains a general southerly direction until it empties into the Gulf of Alaska, in about latitude 60° N. and longitude 145° W. (Map: Alaska, F 3). Its total length is about 500 miles, and it receives a number of tributaries, some of which bring down copper in solution—hence the name of the river.

COPPERSMITH (translation of the native Philippine *tambagut*, which is imitative of the bird's cry). One of several barbets (q.v.) of India and eastward to the Philippines, which are called by the natives by names meaning 'coppersmith,' 'ironsmith,' etc., on account of their sharply accented metallic notes. A familiar species in Natal is called 'tinker-bird.' They are gorgeously plumaged, sluggish, fruit-eating birds, very numerous and noisy, but keeping in the tops of the trees and making only short, heavy flights. The crimson-breasted coppersmith (*Megalana harnacephala*) is one of the best-known and most gaudy.

COPPET, kô'pâ'. A village in the Canton of Vaud, Switzerland, situated on the west bank of the Lake of Geneva, nine miles north-northeast of Geneva (Map: Switzerland, A 2). It has a charming appearance, and is famous as the residence of Madame de Staël. Population, in 1900, 552.

COPPICE. See COPSE.

COP'PINGER, JOHN JOSEPH (1834—). An American soldier. He was born at Queenstown, Ireland, and early joined the Papal Army in the struggle against King Victor Emmanuel. Afterwards he came to the United States, was appointed a captain in the Fourteenth Infantry in 1861, served throughout the Civil War, being brevetted major and lieutenant-colonel for gallantry at Trevillian's Station and Cedar Creek, respectively, in 1864. In 1865 he became colonel

of the Fifteenth New York Cavalry. He served in several Indian campaigns (1866-68), receiving the brevet of colonel (1868), and was promoted to be major of the Tenth Infantry (1879), lieutenant-colonel of the Eighteenth Infantry (1880), colonel of the Twenty-third Infantry (1891), and brigadier-general on April 25, 1895. During the Spanish-American War he was appointed major-general of United States Volunteers, and was placed in command of the Fourth Army Corps, stationed at Camp Wheeler, Huntsville, Ala. He was retired from active service October 11, 1898.

COPPINO, kôp-pē'nô, MICHELE (1822—). An Italian statesman and author. He was born in Alba, Piedmont, and was the son of a shoemaker in that city. He was educated in Turin, where he became professor of Italian literature in 1861 and rector in 1869. He was Minister of Education in the Cabinets of Rattazzi (1867), Depretis, Cairoli (1876-79), Depretis (1884-88), and Crispi (1888-91), in which capacity he introduced several marked improvements and secured the passage of an important law regulating compulsory elementary education. His most important work is the *Parole al popolo italiano* (1848).

COP'RA (Hind. *khoprâ*, from Malayalam *Koppura*). The dried kernel of the coconut. It is much used in India as an ingredient of curries, but its chief value is for the coconut oil which is extracted from it. It is stated that 500 pounds of copra yield 25 gallons of oil.

COPRI'NUS. See FUNGI, EDIBLE, for article and Colored Plate.

COPROLITES (from Gk. *κόπρος, kopros*, dung + *λίθος, lithos*, stone). The fossil excrements of animals found at times in the Paleozoic and Mesozoic strata of the earth's crust. Their true nature was first inferred from their occurrence in the bodies of several species of ichthyosaurus, in the region where was situated the intestinal tube. It has been since shown that they are the voidings chiefly of saurians and also of fishes. They often contain portions of scales, bone, teeth, and shells, the indigestible parts of the food on which the animals lived. Occasionally they may be found exhibiting the spiral twisting and other marks produced by the conformation of the intestinal tube, similar to what is noticed in the excrement of some living fishes, and some specimens have been erroneously described as plants. These peculiar markings obtained for them the name, when their true nature was unknown, of 'larch-cones' and 'bezoar-stones.' Coprolites are found to contain a large quantity of phosphate of lime; and as this forms a valuable manure, the deposits containing them have been of late years largely quarried.

Among the most interesting coprolites are those of spiral form from the Waverly group of Pennsylvania and elsewhere, originally described as fossil algæ and problematic plants under the generic names of Palæoxyris, Spirangium, Spiraxis, and now known to be the dung of ancient shark-like fish such as Cladoseleche. The silicified coprolites of the Lias of Hanover, Germany, have afforded great numbers of radiolarian remains which have been described by Rüst. (See RADIOLARIA.) Consult: Mantell, *Petrifactions and Their Teachings* (London, 1851); id., *Medals of Creation* (London, 1844).

COPSE, or **COPPICE** (OF. *copciz*, from *copcr*, Fr. *couper*, to cut, from OF. *coup*, *caup*, *cop*, *colp*, Fr. *coup*, from ML. *colpus*, blow, from Lat. *colapulus*, Gk. *κόλαφος*, *Koluphos*, bullet, from *κόλαπτειν*, *kolaptein*, to strike). A name given in England and elsewhere to a natural wood or plantation in which the trees are periodically cut before being allowed to attain the size of timber-trees, and where new shoots are permitted to grow from their roots or stumps. Some kinds of trees refuse to send up new shoots; but many—as the oak, birch, chestnut, ash, elm, maple, alder, hazel, and willow—very readily do so, especially when not allowed to attain too considerable a size before being cut over. Copse woods are sometimes planted to vary and beautify the landscape, but more generally with a view to profit, either owing to a great local demand for their produce, or to peculiarities of soil and situation. It often happens that, owing to scantiness of soil or to unfavorable subsoil, oaks and other trees, after growing vigorously for a number of years, are arrested, and remain almost stationary in their growth. In such circumstances, it is advantageous to cut them over early, and to treat the plantation as a copse, the former vigor being again manifested in the young shoots, and the land yielding in this way a greater return to its owner. Oak and birch are much planted as copse wood, in consequence of the demand for their bark; the trees are cut over every twelve to twenty-five years, dependent upon the character of the soil, climate, etc. The largest pieces of the wood are used for making wheel-spokes and for other purposes of timber; the smaller portions are used for making charcoal and firewood. Ash is sometimes planted as copse, with a view to the employment of the wood for handles of implements, hurdles, hoops, etc., the wood of the ash, even when very young, being highly valued for strength and elasticity. Chestnut copses are planted in England to supply hop-poles. Hazel is a very common copse wood, being in great demand for making crates, etc. Besides the cultivation of different kinds of willow or osier for basket-making, in which they are cut over annually, some of the species are cultivated as copse, and cut every five, six, or seven years, for hoops, crates, etc., the species which is deemed most suitable being *Salix cuprea*. *Salix alba* is also commonly employed in copse plantations for larger willow wood. In some countries copse wood is particularly valued for the regular supply of fuel which it affords.

In cutting copse wood, care is taken to dress the stumps so that water may not lodge in them and cause them to rot. The size to which the stems are allowed to attain before being cut, and the frequency of cutting, differ according to the different kinds and the uses intended. Stems more than four inches thick are generally cut with the saw, but smaller stems with a curved bill or axe cutting upward.

COPTIC VERSION. See BIBLE.

COPTIS (Neo-Lat., from Gk. *κόπτειν*, *koptein*, to cut; referring to its divided leaves), or **GOLD-THREAD**. A genus of plants of the natural order Ranunculaceæ. *Coptis trifoliata*, the best-known species, is a native of the north of Europe, Siberia, Greenland, Iceland, and North America. It grows in swamps, and derives its popular name from the golden-yellow color of its long,

thread-like rhizomes. The rootstocks are very bitter, and have some reputation as a tonic. They also contain a yellow dye. The leaves of this plant have three wedge-shaped leaflets, and its leafless stems bear each a solitary, rather pretty, white flower, the petal-like sepals of which have yellow bases.

COP'TOS. See KOPTOS.

COPTS. The name given to the Christian descendants of the ancient inhabitants of Egypt. The Arabic word *Qubt* is probably nothing but a mutilation of *Egypt* (not of *Koptos*, or *Jacobite*). The present number of the Copts is estimated as high as 500,000 by some authorities; other authorities give much lower figures. They are most numerous in the towns of Upper Egypt, south of Assiut. As they usually live in towns and are rarely engaged in agriculture, they present a certain contrast to the Mohammedan peasants. They are as a rule of smaller stature than the latter, and of a lighter complexion. Most of the Copts still wear the black coat and black or blue turban which they were forced to assume in the time of the Mohammedan persecution. They are frequently goldsmiths and money-lenders, and they are also excellent clerks and accountants, although few of them attain to the higher governmental positions. Their character is apt to be marked by sullenness, distrust, and avarice. Although the Arabs owed the conquest of Egypt to the assistance of the Copts, they soon began to oppress them cruelly, taxing them to the utmost, hindering their religious worship, and occasionally even branding them. These persecutions reduced the numbers of the Copts very considerably. A few of them are at present adherents of the Roman Catholic Church; still fewer of the Greek Church. The majority adhere to the old National Church, which originated in a schism after the rejection by the Council of Chalcedon (A.D. 451) of the monophysitic doctrine, the Egyptians not accepting the decision of the council. A long and bitter struggle against the orthodox Byzantine Government arose, lasting until this was replaced by the Arab invasion. The Coptic sect is also called Jacobite, after a prominent teacher of the fifth century. The highest ecclesiastical dignitary of the Monophysitic Church is the Patriarch of Alexandria, who at present, however, resides at Cairo. This patriarch is always chosen from the monks of the Convent of Saint Anthony. By him the Metropolitan of Abyssinia is nominated. The rest of the clergy represent orders similar to those of the Roman Catholic Church. They have twelve bishops. The monks and nuns were once very numerous, but they have in the course of time greatly diminished in number. The elaborate rites of the Church present some rather curious features—e.g. the celebration of the Lord's Supper with unleavened bread dipped in wine, and the strict division of the sanctuary or chancel from the body of the church. The Copts practice circumcision and baptize by immersion. The feasts and fasts, which are very strictly observed, are numerous. Owing to the extreme length of the service and the absence of seats, many worshipers lean on crutches which they bring with them. The Copts are very bigoted, and are especially fanatical against other Christian denominations. Of late, however, the American Presbyterian mission has worked among them with success. At Qus it

converted the Coptic bishop and his whole congregation. The Coptic language, which was spoken from the third to the sixteenth century, but has now become extinct as a vernacular, belongs to the Hamitic group of African languages. It is of great importance linguistically as being the descendant of Ancient Egyptian (see EGYPT, paragraph *Language*), although its own literature is of comparatively small importance. In character Coptic was at first almost monosyllabic, like Egyptian, but it developed at a later period into a highly agglutinate language (q.v.). The morphological side of Coptic was, therefore, little developed, but the phonology became the real basis of the grammatical system for variations of meaning. It gained in consequence a far greater flexibility than Egyptian had possessed, and it also enriched its vocabulary by many Greek loan-words, as well as a smaller number of Latin and Persian terms. Arabic words are significantly lacking in the Coptic vocabulary. The language was divided into five principal dialects. These were the Sahidic or Thebaic and Achmimic in Upper Egypt, the Boheiric, and Memphitic in Lower Egypt, and the Fayumic, or so-called Bashmuric, spoken near Lake Menzaleh in Central Egypt. There were also doubtless a number of dialects of much importance of which no record has been preserved. Of the Coptic dialects the oldest is the Sahidic, whose literature dates from the period extending from the third to the seventh century, comprising annals, translations of the Bible, apocryphal and Gnostic books, legends of the saints, and the like. This oldest literature has been in great part lost, and only fragments remain. The Boheiric dialect, dating from the seventh century, contains by far the greater amount of extant Coptic literature, again in the main translations from the Greek or revisions of the older Sahidic texts, as well as a few translations from the Arabic. It is this dialect which is still used in the liturgy of the Coptic Church. The Fayumic dialect has only very scanty literary remains, which have been discovered lately by excavations in Egypt. The Sahidic is the most harmonious and has more Greek loan-words than the Boheiric, while the Fayumic stands midway between the two. The Coptic script has thirty-one letters, twenty-four of which are Greek uncials (see UNCIAL LETTERS), while the remaining characters, for š (sh), f, h (German *ch*), h, z (French *j*), c (English *ch* in *child*), and ti, are derived from the Egyptian demotic script. After the Mohammedan conquest of Egypt Arabic gradually displaced Coptic, although Coptic is said to have been spoken as late as 1633 by one old man.

Consult: Kircher, *Prodromus Coptus sive Ægyptiacus* (Rome, 1636); *Lingua Ægyptiaca Restituta* (Rome, 1643-44); Tattam, *Compendious Grammar of the Egyptian Language* (London, 1830; 2d ed. 1863); Rosellini, *Elementa Linguae Ægyptiæ sive Copticæ* (Rome, 1837); Peyron, *Grammatica Linguae Copticæ* (Turin, 1841); Schwartz, *Koptische Grammatik* (Berlin, 1850); Uhlemann, *Lingua Copticæ Grammatica* (Leipzig, 1853); Stern, *Koptische Grammatik* (Leipzig, 1880); Loret, *Manuel de la langue égyptienne* (Paris, 1892); Steindorff, *Koptische Grammatik* (Berlin, 1894); Peyron, *Lexicon Linguae Copticæ* (Turin, 1835); Tattam, *Lexicon Ægyptiaco-Latinum* (Oxford, 1835);

Partley, *Vocabularium Coptico-Latinum et Latino-Copticum* (Berlin, 1844).

COP'ULA (Lat., bond). A term employed in logic to designate the word which expresses the relation of subject and predicate in a judgment. Thus, in the sentence "Art is long," *art* is the subject-concept, *long* the predicate-concept, and *is* the copula. The copula is either expressed separately, as by some part of the verb 'to be,' as in the above sentence, or it is contained in the word expressing the predicate—as, "The flower blooms," i.e. *is* blooming.

COPULATIVE (Lat. *copulativus*, from Lat. *copulare*, to join together, from *copula*, bond, from *co-*, together + *apere*, Gk. *ἄπτειν*, *haptein*, to fasten). A term applied to words and sentences that introduce something which adds to the preceding thought, in the same direction. They are sometimes for this reason called cumulative conjunctions. The principal ones are *and* (the typical copulative conjunction), *also*, *as well as*, *likewise*, *moreover*.

Adversative, marking degrees of opposition of thought in the words and expressions connected; as, *but*, *however*, *nevertheless*, *only*, *still*, *yet*.

Causal, introducing a reason or cause; as, *consequently*, *for*, *hence*, *then*, *therefore*.

Alternative, expressing a choice between two or more things; as, *either*, *else*, *nor*, *neither*, *whichever*.

When two conjunctions connect closely related parts of a sentence they are called correlatives, as, *either—or*, *neither—nor*, *whether—or*. The subordinating conjunctions may also be subdivided, the principal classes being place, time, manner, cause, comparison, purpose.

COPY (OF. *copie*, abundance, from Lat. *copia*, from *co-*, together + *opcs*, riches). In the fine arts, a reproduction of a work, whether painting, statue, or engraving, not by the original artist. A copy made by the master himself is called a repetition or replica (in French, a *doublette*). A copy of a statue, or other piece of sculpture, taken from a mold, is not called a copy, but a *cast* (q.v.).

COPYHOLD. A species of estate or right of property in land in Ireland and England, the modern form of the ancient tenure in villeinage, and closely resembling in many particulars the feu rights of Scotland. Copyhold is expressed technically as "tenure by copy of court-roll at the will of the lord, according to the custom of the manor." This means that it is tenure of land, being part of a manor, the title being evidenced by the court-rolls of the manor, and the right of the owner being in conformity with the immemorial customs of the manor. The addition, "at the will of the lord," serves only as a memorial of the derivation of this species of estate from the estates granted in old times to the bondmen, or villeins, which estates were of course resumable at the pleasure of the lord. But the will of the lord is now absolutely controlled by the custom of the manor, which forms the law of the tenure; and as this custom must be immemorial, i.e. extending to the reign of Richard I., no new copyholds can be created.

The custom of each manor may vary in important particulars. In some the copyhold lands are held for life only; in some they descend according to particular rules of their own; in most, however, they descend according to the

ordinary rules of succession. But the custom, whatever it may be, cannot be altered by the holder of the copyhold; he cannot, for instance, entail his land unless the custom warrants it.

One practical distinction of much importance, drawn between freehold and copyhold land, is the mode in which it must be conveyed. An ordinary conveyance is ineffectual in regard to copyhold, and, indeed, would operate, like other attempts to break through the custom which forms the title, as a forfeiture. The owner comes to the steward of the manor, and by a symbolical delivery, according as the custom may prescribe, surrenders the land to the lord of the manor, in order that it may be granted again to such person and on such terms as are desired, and as the custom authorizes. The steward, by a repetition of the symbolical delivery, transfers the copyhold to the person in question in terms of the surrender; and the transferee then pays the customary fine, and takes the oath of fealty. This is called conveyance by surrender and admittance. In the case of an heir succeeding there is no surrender, but there is admittance only upon payment of the customary fine, and it is enforced by a customary penalty. A mortgage is effected by a surrender upon condition that the money is repaid, and the admittance takes place only in event of failure of payment. A copyhold may in like manner be devised by will, the devisee being admitted on the death of the deviser.

The inconveniences and loss accruing through the variety of customs to which copyhold lands are subject led the legislature to provide for their gradual extinction. By consent of the copyhold commissioners, all the services due to the lord of the manor may be commuted for a fixed rent. The lord of every manor is also authorized to enfranchise, or convert into freehold, the copyhold lands by agreement with their owners, and either the lord or the tenant may compel enfranchisement on payment either of a fixed sum, where it is at the instance of the lord, or of an annual rent, where it is at the instance of the tenant, fixed in both cases by the commissioners. See MANOR; TENURE; SERF; and consult: Elton, *Treatise on the Law of Copyholds and Customary Tenures of Land* (2d ed., London, 1893); and Scriven, *Treatise on Copyhold, Customary Freehold, etc.* (7th ed., London, 1896).

COPYING. A term applied in photography to the reproduction of paintings, engravings, manuscripts, maps, etc. A copying camera is usually employed, but any form of camera, where the distance between the lens and plate can be made sufficiently great, may be used for this purpose. The lens should be rectilinear, with a tolerably wide angle of aperture, and slow plates are considered preferable. Care should be taken in developing to use a sufficient restrainer and camera, and suitable color-screens.

It is important that the work or surface to be copied should be placed in a strong light, and exactly at right angles to the axis of the lens, which should be furnished with a *small* stop. These three conditions, it will be seen, are such as are calculated to insure density in the blacks of the negative, freedom from distortion, and sharpness at the edges of the picture. The copying of oil-paintings seems to the amateur, at first sight, to present almost insuperable difficulties, on account of the reflected light from the varnish passing through the lens, and producing

black patches on the negative. This may, however, be completely avoided by the employment of a lens of long focus, which admits of the oblique pencils of light passing off without entering the camera, and suitable color-screens.

In copying transparent negatives, a somewhat different arrangement is required, as will appear from considering the following facts. Every object to be copied may be regarded, for the sake of illustration, as an assemblage of bright points, from each of which divergent pencils of rays are reflected, and suffer refraction on passing through the lens; an engraving or oil-painting is, in fact, in its relation to the sensitive surface, the *source of light*. In a negative, however, many of the parts of which are transparent glass, it is manifest the case is different, for if we suppose the sun or a luminous background to be placed behind the negative, *that* will act as the source of light, and any rays coming therefrom will pass almost directly through those parts of the negative which are bare glass, to the lens; thus producing the same effect as if the transparent parts were opaque, but luminous, and emitted divergent pencils of light. It is necessary, therefore, that the rays should be made to converge at those points where bare glass exists, and this may be accomplished by employing what is called a condensing lens, by which means negatives may be most successfully copied, by placing an artificial light behind it, or still better, by reflected sunshine through it.

Negatives are sometimes copied on glass by direct superposition in the ordinary printing frame, such as is used for printing photographs on paper, being exposed to a gas-flame or other source of light, and then developed in the usual way. See PHOTOGRAPHY.

COPYING MACHINES. The various contrivances for procuring duplicates of manuscripts without the labor of transcribing them may be reduced to two classes. In the one, the writing is first made, and then copied; in the other, the copy and the original are produced at the same time. The essence of the first method is this: In writing the original, an ink is used that is made for the purpose, or common ink is thickened by the addition of a little sugar. When the writing is dry, a damped sheet of thin unsized paper is laid upon it, and over this a piece of oiled paper. The whole is then subjected to pressure, and the damped paper is found to have received an impression of the writing. It is of course the reverse of the original, but the thinness and transparency of the paper allows it to be read right on the other side. The machines for communicating the pressure are of various kinds. Some pass the sheets between rollers like the copper-plate press; others act on the principle of the simple screw-press. A simple plan is to wrap the sheets around a wooden roller of about an inch diameter, lay this upon a table, and roll it under a flat board, pressing all the while. In the second method of copying, prepared blackened or carbon paper is laid between two sheets of thin writing-paper. The writing is traced firmly on the upper sheet, with a steel or agate point, or common black-lead pencil, and the lines are found transferred in black from the blackened sheet to the paper adjacent. By having several of these blackened leaves, a number of copies may be produced at once, so that the method can be employed in duplicating invoices,

newspaper-copy, and telegraph messages. The blackened paper is prepared by saturating it with a mixture of lard and lampblack. The *manifold writer* of Wedgewood, invented in 1806, was on this plan.

The first suggestion for a copying press is said to have been made by Benjamin Franklin, who sanded the yet wet ink of his manuscript with emery and then passed the manuscript between rollers in contact with a soft, highly polished pewter plate. This received the impression from the emery, from which numerous copies could be made by the copper-plate printing process. In 1780, James Watt adopted the simple plan of copying by pressing transparent, bibulous paper against the damp manuscript, so that the writing would be transferred as on a blotter and then read from the other side.

In the *papyrograph* a specially prepared paper is used, upon which words are written with a common pen, but with a special ink. The sheet is then soaked in water, and the ink corrodes the fabric of the wet paper, leaving open lines in place of the writing. The sheet is then used as a stencil, like that prepared by the electric pen. The *mimcograph* is an apparatus invented by Thomas A. Edison, by which stencils of written pages are obtained for the purpose of producing an indefinite number of copies. It consists of a fine-pointed steel stylus, moving over the surface of a sheet of tissue paper, coated on one side with a film of sensitive material. This paper is placed on a plate of steel, known as the baseboard, upon which are cut intersecting corrugations, numbering 200 to the inch. As the stylus moves over the paper it presses it down upon the steel plate, and the fine sharp points puncture the paper from the under side in the line of the writing. This paper, or stencil-plate, is then fastened into a frame, which stretches it tight and smooth, again placed upon the baseboard with a sheet of paper between, and an ink-roller of peculiar construction is passed over its surface, forcing the ink through the perforations upon the paper beneath, thus making a print. The patent for this instrument was applied for in 1878, and there have been numerous improvements since, the apparatus being used extensively in connection with the typewriter, where the stencil is made by the type bars striking a sheet of paper laid against a piece of gauze.

THE BLUE-PRINT PROCESS is peculiarly adapted to the reproduction of drawings and plans, and is used by architects, engineers, and mechanics. Two solutions are prepared: the first contains one part of citrate of iron in four parts of pure water; the second contains one part of red prussiate of potash in six parts of water. When ready for use, equal parts of the solutions may be mixed in a shallow dish, and applied to sheets of paper with a sponge or a camel's-hair brush. Any paper will serve, but that is best which has but little sizing. The solution should be applied and the paper should be dried and kept in the dark. The solutions themselves will keep, separately, in the dark as long as desired, but if mixed soon begin to deteriorate. The drawing or writing to be copied should be made with very black ink, upon paper or tracing-cloth. A photographer's printing-frame, with a plain glass and a back easily removed, is used in the following manner: Place the drawing face down upon the glass; the prepared paper with its face

against the back of the drawing; put the movable back in place, reverse the frame, and expose to light. In direct sunshine, two to seven minutes will be long enough, the time to be ascertained by trial; in diffused light, the exposure must be five to ten times as long. After exposure the print should be immediately washed in clear water; when the chemicals are removed, the sheet is fastened by its corners to a line to dry, and the surface may afterwards be finished by a hot iron, or by pressure. A little practice is needed to secure the best results, and in a good print the lines will be clear white, and the background a deep blue. A light blue background indicates a weak solution, or insufficient exposure; over-exposure is shown by a grayish tint. Clear, quick sunshine will give sharper lines than can be obtained by slow, diffused light. The chemical change is evident; the light causes a reaction between the prussiate of potash and the iron, of which Prussian blue is the product; this occurs whenever the light has not been intercepted by the black lines of the drawing, which therefore appear in white upon an intensely blue and unfading background. Copies may be multiplied at will from negatives on glass or films, from engravings in books, from drawings, or from manuscripts.

BLACK PRINTS on a white ground may be made in the same general way, by using the proper solution in preparing the paper, and sometimes the process is reversed.

COPYRIGHT. The exclusive right of reproducing, by writing, printing, or otherwise, the language and form of a literary or artistic production, and of publishing and vending the same. In this broad sense the right is wholly modern, being based upon a series of statutes, beginning with 8 Anne, c. 19, in England, and with the first Federal Copyright Act passed by the Congress of the United States in 1790.

Copyright in published works exists in England to-day by virtue of the Copyright Act of 5 and 6 Vict., c. 45 (1842). With this must, however, be considered the following amendments: 1844, international provisions; 1847, Colonial act; 1850, designs and sculpture; 1852, international and engravings; 1862, fine arts; 1875, international, for dramatic works; 1875, Canada; 1882, musical compositions; 1886, international; 1887, order in council (confirming the Bern convention); and 1888, musical compositions. In the United States, the matter is one for national and not for State regulation, the power "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries" being vested in Congress by Art. I, Sec. 8 of the Constitution. The only effective restriction which this clause places upon the power of Congress to legislate concerning copyrights is the virtual prohibition of the grant of a perpetual right of this character. The apparent limitation of the power to a copyright for 'writings' only, has been removed by judicial construction, the term 'writings' having been held to include maps, charts, music, prints, engravings, drawings, paintings, and photographs, as well as books, written and printed articles, and the like. The power to protect the author of a book in the right to dramatize the same, and the author of a dramatic composition in the right of publicly performing or repre-

senting it, is obviously included within the constitutional provision. But it is not clear whether the protection afforded by the copyright law to sculptors places them in the category of authors of writings or of inventors or designers. However this may be, there is no dispute as to the authority of Congress to enact general copyright legislation.

The law now in force is to be found, in substance, in U. S. Rev. Stat., Tit. 60, Chap. 3. The most important modification of this act is the enactment of March, 1891, introducing international provisions. Further amendments are: 1893, deposit of copies; 1895, limitation of penalty for art infringements; 1897, additional penalty for dramatic infringements; 1897, instituting the register of copyrights; 1897, penalty for fraudulent notice. Under the act of 1870, the supervision of the business of copyrights is placed under the control of the Librarian of Congress. Under the act of 1897, the office of Register of Copyrights was created. The details of the copyright business are managed by the Register, who remains, however, subject to the general supervision of the Librarian of Congress. The statute provides that two copies of the work copyrighted, printed from type set within the limits of the United States (except in the case of musical compositions), shall be deposited in the office of the Librarian of Congress not later than the day of publication of the work in this or any foreign country. The original jurisdiction of all suits under the copyright laws rests with the United States circuit courts. Under the interpretation of the United States courts, copyright in published works exists only by virtue of the statute.

The terms of these acts are very similar to those of the English law, and provide that the author, inventor, designer, or proprietor of any book, map, chart, dramatic or musical composition, engraving, cut, print, or photograph, or negative thereof, or of a painting, drawing, chromo, statue, statuary, etc., being a citizen of the United States or a resident therein, or a citizen of any State which grants reciprocal privileges to citizens of the United States, may secure the sole liberty of printing, reprinting, publishing, copying, executing, and vending them for the term of twenty-eight years, which period may, on the application of the author or inventor, or, if he be dead, of his widow or children, be extended to a further period of fourteen years. The time limit of the first American Act is that specified (for books thereafter printed) in the English statute of 1709, and was originally adopted by analogy from the Statute of Monopolies (21 Jac. I., c. 3), which permitted a royal patent to be granted to any inventor of a new manufacture for the sole working or making of the same for a period of fourteen years, and which is the foundation of our patent laws.

WHAT MAY BE THE SUBJECT OF COPYRIGHT. In order to make clear the claim of a work to copyright, it is necessary that it should be original, but the originality can exist in the form or in the arrangement, as well as in the substance. Corrections and additions to an old work (itself not the property of the compiler) can also secure copyright. The copyright of private letters constituting literary compositions is in the composer, not in the receiver. As to the right of property in lectures, whether written or oral, the Ameri-

can courts have followed the English precedents. The most important English decision on this point is that of *Abernethy vs. Hutchinson* (1801). In *Putnam vs. Meyer* (1886), the New York Supreme Court held that certain tabular lists of anatomical names, arranged in a peculiar and arbitrary manner for the purpose of facilitating the work of memorizing, were entitled to protection. Abridgments and abstracts which can be called genuine and just are also entitled to copyright. There is no record in the United States of a case in which consideration has been given to the question of copyright in irreligious books.

It is to be borne in mind that what is thus protected by law, and thus erected into a species of property, is not the ideas, sentiments, and conceptions of the author, artist, or designer, but the substantial form in which he has embodied them. There is no property in thoughts and feelings, and there can therefore, in the legal sense of the term, be no theft or piracy of ideas. It is the literary or artistic creation, i. e. the form, which is protected, and not the substance. Hence ideas, whether expressed in conversation or in lectures or in copyrighted books, immediately become common property and may be employed by any one who will clothe them in a new and different form from that in which they were communicated to him. But the new form must be substantially different from that of the copyrighted matter. It must not be merely a disguised copy or reproduction of the original, for the law protects the arrangement of the matter as well as the language in which it is conveyed. On the other hand, as it is the financial and proprietary interest, and not the pride of the author, which the copyright law seeks to protect, it is no infringement of his rights to make a fair and reasonable use of a book by way of quotation or otherwise, whether for purposes of criticism or for the private use of the reader. Thus it has been held that "extracts and quotations fairly made, and not furnishing a substitute for the book itself, or operating to the injury of the author, are allowable." Furthermore, as the law is aimed at reproducing a work by printing, publishing, dramatizing, or translating any copy thereof, it is conceived that it is no infringement of the author's copyright to read in public a printed poem or other literary production, though of course it cannot be reprinted in a newspaper or magazine, even as an item of news, without permission. It has, however, been held by the English Courts that the presentation, through reading or through singing, of a copyrighted work to a public which makes payment for the privilege, constitutes an infringement.

It is not necessary that matter shall be literary or artistic in form, nor even that it shall be original in substance, to be entitled to copyright. A translation or dramatization of another's work may be so protected, and so may be an abstract or newspaper report of a speech, a judicial opinion, or a debate. The law extends equally to compilations of the writings of others, to dictionaries, gazetteers, road and guide books, directories, calendars, catalogues, mathematical tables, and the like, the arrangement of the material being protected even though the matter of which it is composed is common property.

There is in the United States no general principle of law conferring the copyright on all pub-

lished works, nor does it arise in favor of an author merely by virtue of his authorship. It is a peculiar privilege, which can be had for the asking, but which is not conferred on those who do not seek it. It is still possible for an author or an artist to dedicate the productions of his genius to the public. Having once done this by publishing his work, he is precluded from setting up an exclusive title to it thereafter. In other words, the steps requisite to secure copyright of any work entitled thereto must be taken in advance of publication. The process of obtaining a copyright is very simple, consisting only in the deposit in the Library of Congress at Washington, not later than the day of its publication in this or any other country, of a copy of the title-page and two copies of the book or other work to be copyrighted, and printing on the book or other work and on all reproductions thereof a notice that the copyright has been secured, together with the date thereof. In Great Britain, on the other hand, copyright attaches, without previous application therefor, in favor of all books, etc., first published in the United Kingdom. The right does not exist and cannot be acquired in favor of works previously published elsewhere. The English statute provides for registration at Stationers' Hall, not as a prerequisite to the existence of copyright, but as a preliminary to a suit for its infringement.

INTERNATIONAL COPYRIGHT. As already stated, copyright is a matter of only national and local concern. The granting of copyright by one nation to the productions of citizens of another has resulted as a slow development from influences that first began to have effect about the beginning of the nineteenth century. (For a historical treatment of this, see **LITERARY PROPERTY**.) At the present time many of the leading States of Europe have granted international copyright, mostly under specific conditions of time or place of publication. In Great Britain, the copyright law now in force is in substance that of 5 and 6 Victoria, c. 45. The international provisions are contained in the acts of 1844, 1852, 1875, 1886, and the order in council of 1887, confirming the Bern convention. The decision given in June, 1891, by the law officers of the Crown that citizens of the United States could secure copyright throughout the territory of the British Empire by compliance with the provisions of the British statute, enabled President Harrison to include Great Britain in the proclamation of July 1, 1891, in the list of States the citizens of which could secure copyright in the United States under the act of March, 1891. The term is for the life of the author and seven years, or for forty-two years from the date of first publication, whichever may be the longer. The Privy Council is given the authority to license the republication of books which after the death of the author the owner of the copyright may have declined to keep in print. There seems to be no record of editions of any books having been brought into the market under this authority of the Privy Council. The law provides that a copy of the first and of each subsequent edition of every book must be sent, on demand, to the following libraries: The British Museum in London, the Bodleian in Oxford, the University Library in Cambridge, the Library of the Faculty of Advocates in Edinburgh, and the Library of Trinity College in Dublin.

The term for art copyright is fixed, under the

act of 38 George III., at twenty-eight years. Copyright in a dramatic production is protected for the same term, of forty-two years (or for the life of the author and seven years), as that accorded to a work of literature. The copyright in letters vests in the writer, except in so far as any particular circumstance may give to the person to whom the letter is addressed, or to his representatives, a right to publish the same. The perpetual copyright of the authorized versions of the Bible and of the Book of Common Prayer (and possibly, adds Stephen, in the text of acts of Parliament) is vested in the Crown. A perpetual copyright in books first issued by the following institutions (unless such books came into the control of the institutions for but a limited term) is vested in the universities of Oxford, Cambridge, Edinburgh, Glasgow, Saint Andrews, and Aberdeen, and also in each college of the universities of Oxford and Cambridge, in Trinity College, Dublin, and in the colleges of Eton, Westminster, and Winchester. The book of registry of copyrights is kept at Stationers' Hall. There is no obligation to make registration, excepting that such entry must be made before the owner of the copyright is in a position to take action in regard to any alleged infringement. A bill for the reshaping of the British copyright act, known as the Monkswell Bill, is now (1903) on the calendar of the House of Lords. It was originally introduced in November, 1886, at the instance of the British Society of Authors. It was reintroduced, with some material modifications, in 1900. Under this bill, the term of copyright is extended to the life of the author and thirty years.

The provisions controlling copyright in Germany, including Alsace-Lorraine, date from 1871. The statute of June 19, 1901, now in force, made no material changes in the conditions of copyright, but instituted detailed regulations for the relations of authors and publishers, covering the *Verlagsrecht*. There are also acts of January 9, 1876, for sculpture, and January 10, 1876, for photographs. The copyright relations with the United States are defined in the convention of January 15, 1892. The term is for the life of the author and for thirty years thereafter. Copyright registry for the Empire is kept in Leipzig. The protection of the law is afforded to the works of German citizens, whether published inside or outside of the Empire. Under this same law, the works of aliens receive protection provided that they are published by a firm doing business within the Empire. In Italy literary copyright rests upon the statute of September, 1882. The term is for the life of the author and for forty years after his death, or for eighty years from the publication of the work. In Austria the term of literary copyright is thirty years after the author's death. In Belgium copyright (formerly perpetual) is now limited, under the law of 1886, to the life of the author and fifty years thereafter. In Holland, under the law of 1881, the term is for fifty years from the date of publication. In Hungary the term is the life of the author and fifty years. In Japan, under the law of March 3, 1899, the term is the life of the author and thirty years. In Russia the term is for the life of the author and fifty years. In Spain, under the act of 1879, the term is for the life of the author and eighty years.

The United States International Copyright Act

has greatly narrowed the beneficial operation of the law by a provision that a foreign book or lithograph to secure its benefits must be manufactured in this country. Consult: Copinger, *Law of Copyright in Works of Literature and Art* (3d ed., London, 1893); Scrutton, *Laws of Copyright* (3d ed., London, 1896); Drone, *Treatise on the Laws of Property in Intellectual Productions* (Boston, 1879); McGillivray, *The Law of Copyright* (London and New York, 1902); Birrell, *Lectures on Copyright* (London and New York, 1901).

COQUELIN, kô'klân'. BENOÎT CONSTANT (1841—). A distinguished French actor, known as Coquelin Aîné, to differentiate him from his younger brother, Coquelin Cadet. Born at Boulogne-sur-Mer, January 23, 1841, he early showed such dramatic gifts that he was sent to the Paris Conservatoire (1859). The following year he took the second prize for comedy, and made his début on the stage of the Comédie Française in *Le dépôt amoureux*. Later he appeared with brilliant success in *Le mariage de Figaro*, *Le malade imaginaire*, *Le misanthrope*, *Le barbier de Séville*, and other pieces in the classic repertoire. In modern plays he was no less effective, and he speedily became a great popular favorite. His versatility is considered remarkable. Among his creations have been rôles in *Le lion amoureux*, *Gringoire*, *Paul Forestier*, *Les faux ménages*, *Le monde ou l'on s'ennuie*, and *Denise*, to mention only a few. He had been elected a *sociétaire* in the Théâtre Français as early as 1864, but in 1886 he retired and made an extensive tour abroad. In 1888 he visited America. At the end of 1889 he returned to the Théâtre Français, where as a salaried member of the company he remained till 1892, creating among other parts that of Labussière in *Thermidor* (January, 1891). In 1893-94 he appeared again in the United States. His engagement in 1895 at the Renaissance Theatre in Paris led to a lawsuit from the Comédie Française, in which he was condemned to pay damages. In 1897, at the Porte-Saint-Martin, he produced Rostand's *Cyrano de Bergerac*, which has become his most celebrated character. In 1899 came his Napoleon in *Plus que reine*. In 1900-01 he visited America once more, this time in company with Sarah Bernhardt, to whose Due de Reichstadt he played Flambeau in Rostand's *L'inglot*. M. Coquelin is known also as a writer and lecturer, among his publications being: *L'Art et le comédien* (1880), which has been translated into German, and into English (as *The Actor and His Art*); *Les comédiens, par un comédien* (1882); *L'Arnolphe de Molière* (1882); and *L'Art de dire le monologue*, in part by his brother, Coquelin Cadet (1884).

COQUELIN, ERNEST ALEXANDRE HONORÉ (1848—). A French actor, known as 'Coquelin Cadet,' to distinguish him from his more famous elder brother, Constant Coquelin. He was born May 16, 1848, at Boulogne-sur-Mer, and in youth was for a time in the employ of the Northern Railway, but went, in 1864, to Paris to enter the Conservatoire and make a career upon the stage. He was graduated three years later with the first prize in comedy, and made his début at the Odéon. In 1868 he appeared with his brother at the Théâtre Français, and he continued there till 1875, playing in *Les plaideurs*, *Le barbier de Séville*, *Les femmes savantes*, *Le mariage de*

Figaro, *L'arare*, and other well-known pieces. In 1875 he went to the Variétés, but returned to the Comédie Française in the following year, and in 1879 he became a member of the company. Among the principal plays in which he has created parts are: *Le sphinx*, *L'ami Fritz*, *Les corbeaux*, *Denise*, and *L'héritière*. M. Coquelin Cadet owes much of his reputation to the success of the numerous monologues of which he is the author, and in the rendering of which he has gained great popularity in the salons of Paris. He has written also, under the pseudonym of Pirouette, *Le livre des conralescents* (1880); *Le monologue moderne* (1881); *Fariboles* (1882); *Le rire* (1887); *Pirouettes* (1888); and other humorous volumes.

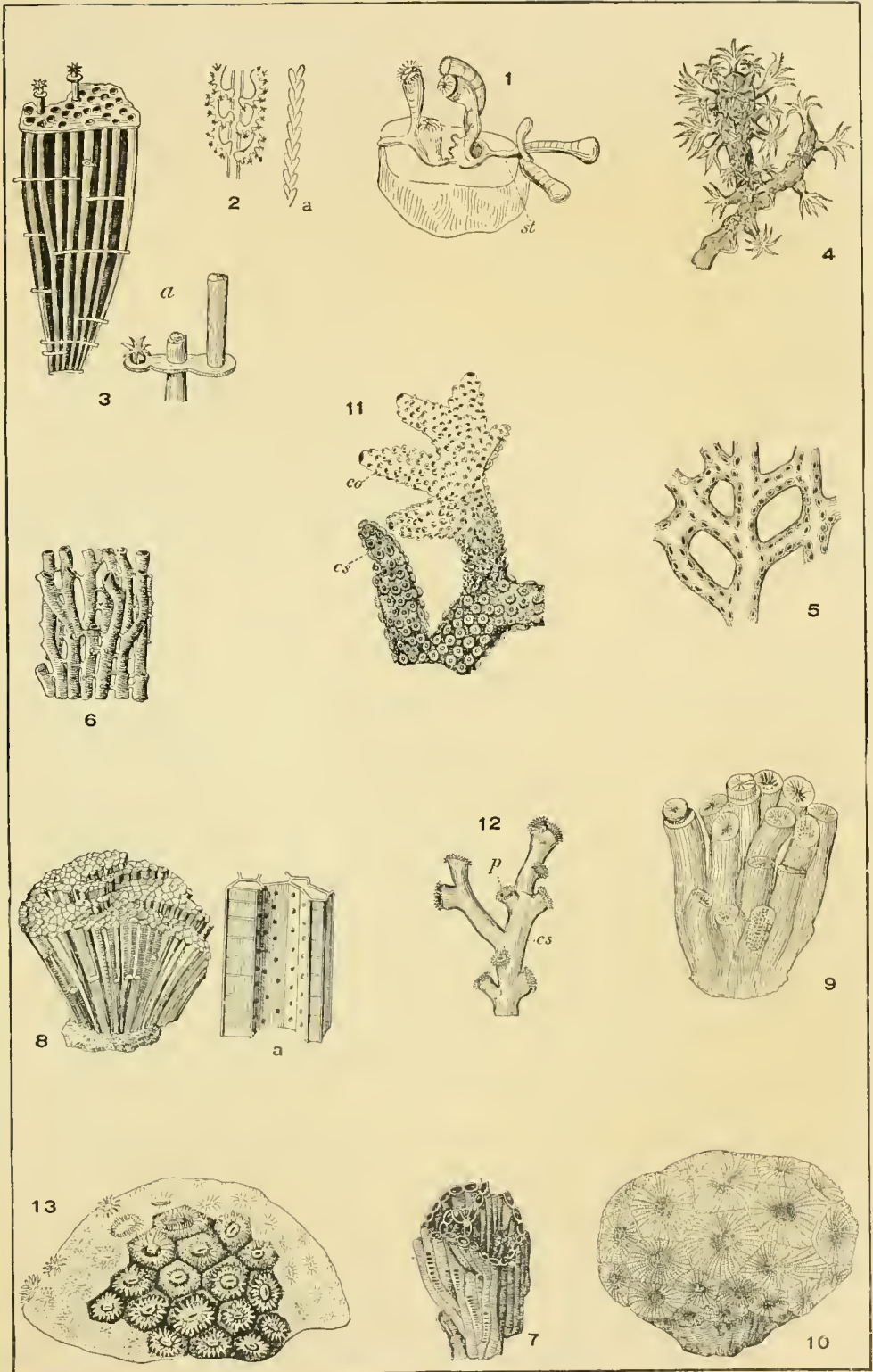
COQUELIN, JEAN (1865—). A French actor, son of Constant Coquelin (q.v.). He studied under his father, and in 1890-92 was engaged at the Théâtre Français. In 1897 at the Porte-Saint-Martin he created the rôle of Raguenau in *Cyrano de Bergerac*. He has also played Lubin in *Thermidor*, Verdet in *Le gendre de M. Poirier*, and Talleyrand in *Plus que reine* (1899).

COQUEREL, kô'krel'. ATHANASE LAURENT CHARLES (1795-1868). A French theologian. He was born in Paris, and studied theology at Montauban. In 1818 he became pastor of the French church in Amsterdam, and in 1830 was induced by Cuvier to return to Paris, where he won high reputation as a pulpit orator. An earnest opponent of the doctrine of predestination, he drew upon himself the violent attacks of the orthodox Calvinists, and propagated his opinions in three periodicals founded by him. He was elected a member of the Constituent Assembly in 1848, and later also of the Legislative Assembly. Among his writings may be mentioned *Réponse au livre du docteur Strauss: La vie de Jésus* (1841), which was translated into English; *Biographie sacrée: L'orthodoxie moderne; Christologie* (1858). His son ATHANASE (1820-75) also won distinction as a pulpit orator and was prominent as the leader of liberal Protestantism in France. He wrote *Libres études* (1867) and *Jean Calas et sa famille* (1870).

COQUES, kôk, or **COCKX**, GONZALES (1618-84). A Flemish painter, born in Antwerp. He studied under the third Pieter Breughel, and afterwards with David Ryckaert the elder. His works were greatly admired, and he received commissions from many of the notable persons of the time. He married the daughter of Ryckaert, and was president of the Antwerp Guild from 1665 to 1666 and from 1680 to 1681. His portraits usually depict a family group engaged in different tasks, the backgrounds often painted by other artists. They are very small, but a certain elegance of manner has given him the title of 'Van Dyck in miniature.' Among his chief works are "The Scholar and His Family," in the Cassel Gallery, and his own "Family" in the Dresden Gallery, and a portrait of Charles I. of England.

COQUETTE, kô-kët' (Fr. *coquette*, flirt, fem. of *coquet*, gallant, little cock, from *coq*, cock; so called from its fanciful plumage). A kind of humming-bird, of which a dozen species are known, constituting the genus *Lophornis*, and scattered from the lowlands of Mexico to and throughout the Amazon region. The *coquettes* are small, crested, and exquisitely adorned with spangled frills on each side of the neck; the

CORAL



CORAL



ALCYONARIANS AND MILLEPORES.



LIVING MADREPORES.



AN AUSTRALIAN CORAL REEF AT LOW TIDE.

tail is long, graduated, and capable of wide spreading; the colors are unusually varied and brilliant, and the whole effect of the bird is peculiarly gem-like. Two species are illustrated on the Plate of HUMMING-BIRDS. See also CROSS-FERTILIZATION.

COQUI, kō'kē (probably of West Indian origin). A West Indian tree-frog (*Hylodes Martinicensis*) remarkable for undergoing its whole metamorphosis within the egg. "The pairing takes place on land in the months of May and June, when the female lays about twenty eggs, which are enveloped in a foamy mass and glued onto a broad leaf, or hidden in the axillæ of iridescent plants. The mother seems to remain in the neighborhood watching the eggs, which are large, measuring four to five millimeters in diameter . . . pale and straw-colored. The embryo develops neither gills nor gill-openings, but a large, well-vascularized tail, by means of which, being immersed in the watery fluid contained within the egg, it seems to breathe. After twenty-one days the tadpole, having used up all the available yolk and fluid, and most of its own tail, bursts the egg-shell and hops away as a little frog." Consult Gadow, *Cambridge Natural History*, vol. viii. (London, 1901).

COQUILLA (kō-kwil'la) **NUT** (Sp. *coquillo*, cocconut). The fruit of a palm, *Attalea funifera*. It forms an article of export from South America, being used to a considerable extent in America in the manufacture of buttons and in turning, as for making knobs of walking-sticks. It is also called vegetable ivory. See **ATTALEA**.

COQUIMBO, kō-kēm'hō. A seaport in the Province of Coquimbo, Chile, about ten miles south of La Serena, the capital of the province, with which it is connected by rail (Map: Chile, C 10). It has a good harbor, with a lighthouse equipped with a revolving light, and customs office, and is an export centre for ores, chiefly copper. It is the residence of a United States consular agent. Population, in 1895, 6270.

COQUIMBO. See BURROWING OWL.

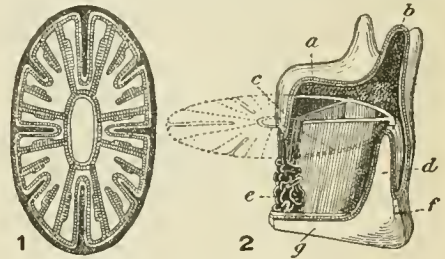
COQUINA, kō-kē'nā (Sp., shellfish, from Lat. *concha*, Gk. *κόγχη*, *kōnchē*, shell, Skt. *śaṅkha*, conch-shell). A porous variety of limestone which occurs in Florida. It is made up of cemented fragments of shells and corals that have been cast about by the waves and accumulated in some sheltered basin of the sea-bottom. Coquina is extensively used for building-stone in Florida and the Bermudas.

CORACLE (Welsh *coragl*, *curiagl*, coracle, from *corwg*, *curiwig*, Ir. *curachan*, skiff). A boat of oval shape with a frame of wicker-work covered with hide or oiled cloth, which covering is removed when the boat is not in use. The ordinary coracle will carry comfortably only one

man, but it is so light that he can easily carry it on his back to a place where it may be safely deposited. See CURRACH.

CORAIS, kō'rā', ADAMANTIOS. See CORAY, ADAMANTIOS.

CORAL (OF. *coral*, Lat. *corallum*, *corallius*, from Gk. *κοράλλιον*, *korallion*, coral; of uncertain origin, possibly a loan-word from Heb. *gōrāl*, small stone). A calcareous or horny secretion or deposit of many kinds of polyps of the class Anthozoa, which assume various and often beautiful forms. Millepore 'coral' is produced by polyps of the class Hydrozoa. (See MILLEPORE.) The coral-producing polyps form colonies which increase by gemmation, young polyp-buds springing from the original polyp, sometimes indifferently from any part of its surface, sometimes only from its upper circumference, or from its



STRUCTURE OF A SIMPLE CORAL.

1. Diagrammatic cross-section of a coral; the black part represents the stony outer wall (theca) and partitions (septa); the open lines, the fleshy lining and partitions (mesenteries). 2. Semi-diagrammatic view of a coral; *a*, a septum; *b*, a tentacle; *c*, position of the gullet; *d*, theca; *e*, mesenteric filaments; *f*, epitheca; *g*, basal plate.

base, and not separating from it, but remaining in the same spot, even when the original or parent polyp has ceased to exist, and producing buds in their turn. The calcareous or horny deposition begins when the polyp is single, adhering to a rock or other surface, on which the coral grows or is built up, the hard deposits of former generations forming the base to which those of their progeny are attached. One layer of the chambers, of which the greater number of corals are composed, occasionally surrounds another like the concentric circles in the wood of exogenous trees; one layer is sometimes deposited above another; the whole structure sometimes branches like a shrub, spreads like a fan, or assumes the form of a cup, a flower, or a mushroom. Under the common name coral are included many species, also designated madrepores (q.v.), and some have received other names derived from peculiarities of their form and appearance, as brain coral, etc. This last forms into large rounded masses furrowed with winding depressions like the convolutions of a man-

REPRESENTATIVE FORMS OF CORALS.

1. Beginning of a colony (of Zoanthus), showing simplest mode of budding from a creeping stolon (*st.*). 2. Sea-pen or pennatulid (*Virgularia mirabilis*); a portion of the stem in the living condition; *a*, the same, dead. 3. Organ-pipe coral (*Tubipora musica*); skeleton of a colony showing two living polyps; *a*, manner of growth, by budding from the lateral shelf-like expansions. 4. Red or 'precious' coral (*Corallum rubrum*); part of a living colony. 5. Part of a fan-coral (*Rhipidogorgia flabellum*), showing the polyp cells. All the foregoing are Alcyonarians. The following are 'true' or 'stony' corals. 6. *Syringopora ramulosa*; fossil in the Carboniferous of Germany. 7. *Halysites catenularia*; fossil in the Silurian of Gotland. 8. *Favosites polymorpha*; fossil; Devonian; *a*, corallites, enlarged, two of them broken open and showing tabulae. 9. Cup-coral (*Cyathophyllum cespitosum*); fossil in the Devonian of Germany. 10. Cup-coral (*Cyathophyllum hexagonum*); fossil in the Devonian of Germany. 11. A madrepor (*Madrepora aspera*); the lower part shows the living polyps, the upper part naked (dead) corallum, at the summit of a bushy branch. 12. Part of a branching coral (*Dendrophyllia*) in which a common calcareous stem (*co.*, coenenchym) is formed by calcification of the coenosarc (*cs*) and gives origin to the individual corallites (*co*); *p*, an active polyp. 13. Star-coral (*Astraea*), an example of the massive type of reef-corals, in its living condition.

malian brain or a meadow brook, hence its technical name is Meandrina. In the greater number of kinds, besides the plates which form and separate the polyp-cells, and which are variously arranged, there is a more solid internal or central part, formed by the additional deposition of matter at the bottom of each polyp-cell, or from the common living part in which the polyps are united. The calcareous framework is sometimes further strengthened by a greater or less mixture of horny animal matter with the purely calcareous substance.

Kinds of Corals.—Corals are roughly classed under two heads, the horny corals and the lime or stone corals. The former consist chiefly of a horny secretion from the polyps, which may include also separate particles of lime, while the stone corals consist almost wholly of lime firmly united in a solid mass. No sharp line can be drawn between these two groups, for all possible gradations can be found. The Antipatharia and Aleyonaria as a rule have a horny skeleton, while the millepores and madrepores are almost wholly limestone. The polyps of the common red or precious coral (*Corallium rubrum*) belong to the suborder Aleyonaria (q.v., for illustration); but the central axis in this and other corals forming the family Corallidæ is quite solid, and is produced in concentric layers by the living gelatinous substance which envelops it like the bark of a tree, and from which the polyps project like buds, or, when their tentacles are expanded, like little flowers. Another aleyonarian coral of more than usual interest is the 'organ-pipe' coral (Tubipora) in which no central axis fills in behind the polyps, but the chambers in which they live remain as open, elongated tubes, crowded together side by side to form a solid mass. Its polyps are violet or grass-green, but the coral itself is red or purplish. These corals are found in the Indian and Pacific oceans. Many of the madrepores have the whole calcareous framework covered, as in the Corallidæ, by a gelatinous living substance which unites all the polyps. The whole living part soon decomposes and disappears, when the coral is taken out of the water, in some species almost immediately running from the calcareous part as a watery slime.

Utilization.—Red coral—so much admired for its fine color and susceptibility to a high polish, and much used for ornamental purposes—is chiefly obtained from the Mediterranean, in some parts of which extensive 'fisheries' are carried on. It is brought up from considerable depths by means of a sort of grappling apparatus dragged after a boat or boats, the pieces being broken from the bottom by beams of wood which are sunk by weights and then entangled among bemp. Red coral has a shrub-like branching form and grows to the height of about one foot, with a thickness like that of the little finger. Much of the coral of the Mediterranean is exported to India, but red coral is also obtained in the Red Sea, the Persian Gulf, etc. Black coral (Antipathes), the axis of which is more solid, is still more highly prized. Coral was known to the ancients, and was used for ornamental purposes by the Gauls.

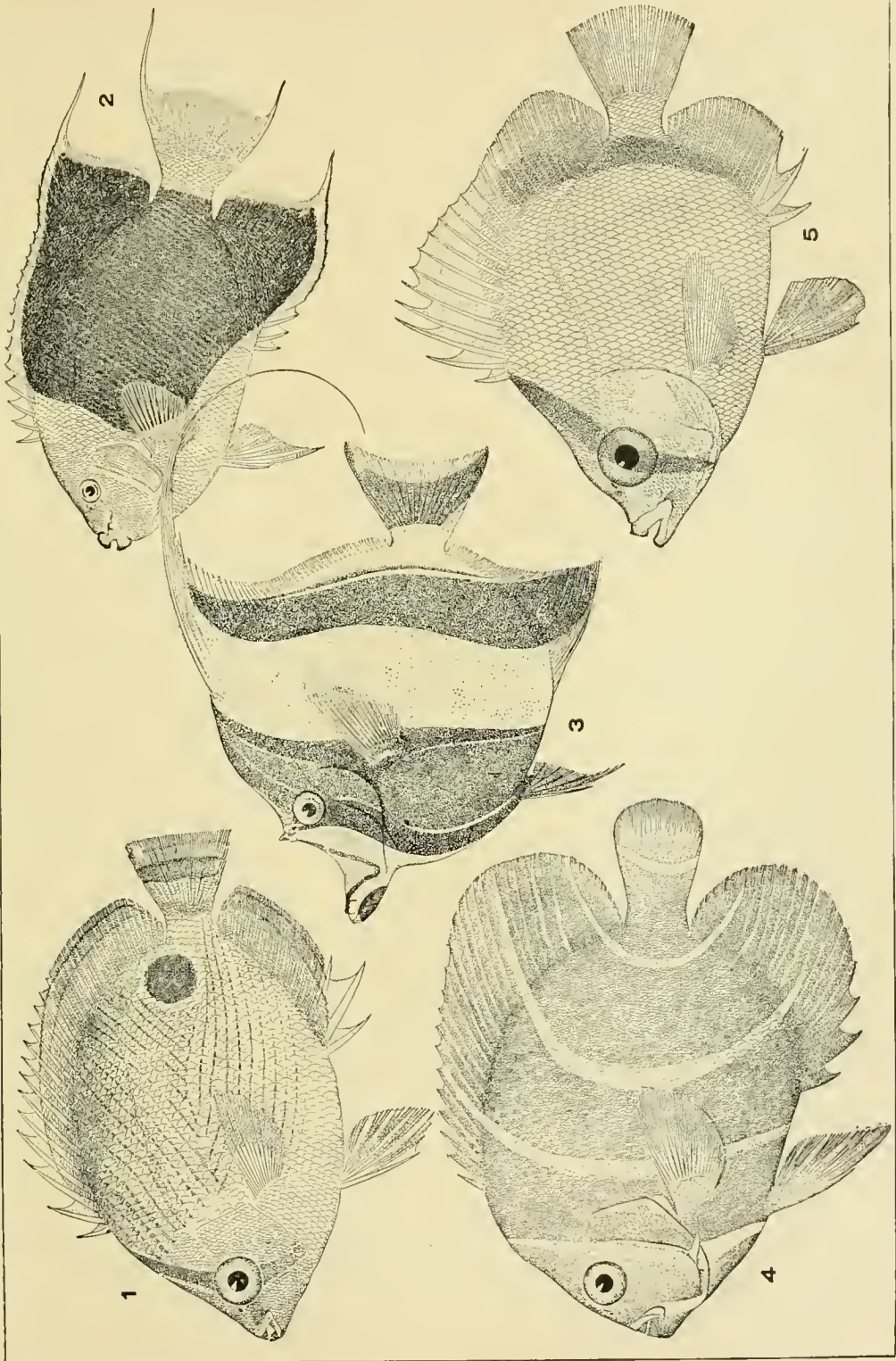
Reefs.—The formation of coral reefs and islands is one of the most noteworthy results of the action of coral polyps. Many kinds of polyps are concerned in the building of a reef, but the

growth is mainly dependent on the stone corals. Reef-building corals only flourish in clean, fresh sea-water, which is not over 125 feet in depth and never is cooler than 68° F. They are consequently confined to the tropics and to shallow water, and never thrive near the mouths of rivers. Although reef-building corals are not found on the coast of the United States north of Florida, some species of coral occur much further north. Even on the coast of New England there is to be found quite commonly a true stone coral (*Astrangia Danaë*), the polyps of which when expanded are large and very beautiful.

Fossil Forms. Among the fossil corals only those belonging to the Anthozoa are of importance, those of the Hydromedusæ either not appearing until the Mesozoic, and then but sparingly (for fossil Hydrocorallinæ and Tubulariæ, see CELENTERATA), or not being clearly recognized as to their systematic position and only provisionally referred to the Hydrozoa. (See STROMATOPORA and GRAPTOLITE.) The Anthozoa appear in the Cambrian rocks with the Archaeocyathinæ, forms of peculiar structure and uncertain relationships. In the Upper Silurian period they have become the most important fossils, as well in number of individuals as in diversity of structure and importance as rock-building organisms. They continue thus throughout geologic times, and are hence of great importance to the paleontologist and geologist. As they are also objects of great beauty, they are much sought by collectors and dealers. Especially rich and famous are the fossil coral faunas of the Silurian of North America and Gotland; the Devonian of the Helderbergs of New York, the Falls of the Ohio, and the Rhenish provinces; the Jurassic formations of Middle Europe and the Tertiary beds of northern Italy.

The Anthozoa are divided by Haeckel into the sub-classes Tetracoralla, Hexacoralla, and Octocoralla, according to the number of their septa, which were considered to be multiples of these figures. The Tetracoralla comprise, together with the Tabulata, the Paleozoic corals; the Hexacoralla and Octocoralla, the Mesozoic and later forms. Recent investigations on the embryology of the Hexacoralla and thecal structure of the Tetracoralla (Dr. M. Ogilvie) seem to demonstrate that these divisions are artificial, that the tetrameral system is only an ancestral feature strongly marked in certain of the old families (Cyathophyllidæ, Zaphrentidæ, Cyathaxonidæ), while hexamerous symmetry is but one of many forms of radial symmetry. The Anthozoa are therefore at present divided into but two sub-classes, according to Ray Lankester: the Aleyonaria or Octocoralla, and the Zoantharia. None of the fossil aleyonarians, which with doubtful forms do not appear till the Mesozoic, are of importance; the Paleozoic Heliolitidæ, which are referred with doubt to this sub-class, are quite abundant in the Silurian and Devonian rocks.

The sub-class Tabulata, of Milne-Edwards and Haime, comprising common and important Paleozoic genera, such as Favosites, Aulopora, Syringopora, Halysites, and Chætetes, which was long considered as a distinct sub-class characterized by the slight development of the septa and the presence of numerous tabulæ, has now been broken up; it having been recognized that some families belong to the Octocoralla, others (Favositidæ, Syringoporidaæ, Halysitidæ) exhibit close relationships to the Hexacoralla, and



1. CHÆTODON CAPISTRATUS.
2. HOLACANTHUS TRICOLOR.
3. ZANELLIUS CORNUTUS.
4. POMACANTHUS ZONISPECTUS.
5. CHÆTODON OCELLATUS.

others (Chætetidæ, Monticuliporidæ) are even placed by some authors, as Ulrich, among the Polyzoa. All these very primitive groups of tabulate corals played important rôles as Paleozoic reef-builders.

BIBLIOGRAPHY. Milne-Edwards and Haime, "Monographie des Polypiers fossiles des terrains Paléozoïques." *Archives du Muséum*, vol. v. (Paris, 1851); Roemer and Frech, *Lithæa Palæozoïca*, vol. i. (Stuttgart, 1883); Ogilvie, "Structure and Classification of Corals," *Philosophical Transactions*, vol. clxxxvii. (London, 1896); G. C. Bourne, "The Anthozoa," in Lankester's *Treatise on Zoology*, part ii. (London, 1900).

CORALBERRY. See SNOWBERRY.

CORAL-FISH. A name given in a general way to various tropical fishes of the families Chætodontidæ and Pomacentridæ, because they frequent submarine coral growths. All are much compressed, high-backed fishes of brilliant hues; and most of them are marked with vertical black bars, and possess filamentous appendages upon the fins and tail. They remain among the branching corals for safety, and are further protected, apparently, by the curious pattern of their coloration. Many species abound in the waters from Bermuda to Brazil, where several species are known as 'angel-fishes.' All are small, but excellent eating.

CORAL ISLAND AND CORAL REEF. An island or marine ridge formed from the petrified skeletons of coral polyps. They are numerous in the warmer portions of the Pacific and in the Indian Ocean, where the growth of coral goes on with great rapidity, occurring to a lesser extent in the Gulf of Mexico and along the Atlantic shores of the West Indies. The coral islands and reefs may be classed, according to their general form, into fringing reefs, barrier reefs, and atolls. *Fringing reefs* are closely attached to the shore line of an island or land mass and extend outward as a submarine platform. *Barrier reefs* lie at some distance from the land, the intermediate space being occupied by a shallow lagoon of salt water. Usually some parts of the barrier rise above the level of the ocean as islets which support a scanty vegetation, while the position of the submerged reef is indicated by a line of breakers. An excellent illustration of this type is the Great Britain Reef of Australia, 1250 miles long, lying off the east coast of Queensland. *Atolls* (q.v.) are of rude circular form, inclosing a lagoon, but without any visible land to which the reefs are attached. Their presence is made known by a girdle of breakers and by wave-formed islets on which the cocoanut-palm and a few other tropical plants grow. The central lagoon of placid, transparent water is usually less than 300 feet deep, and when there are passages through the reef it constitutes a safe harbor for ships. Soundings have shown that the slope of the bottom is gentle in the interior, but very steep on the seaward side of the reef, indeed being sometimes almost perpendicular. The Pelew Islands of the Caroline Archipelago, the Low Archipelago in the Pacific, and the Læcædive and Maldivé island groups in the Indian Ocean, exhibit many examples of atolls.

FORMATION OF REEFS. The great masses of coral rock have been built up by the continuous growth of various genera and species of corals, which secrete carbonate of lime dissolved in the sea-water. The coral polyps flourish only under

certain conditions; their growth requires clear, warm, salt water, an abundance of food, and a water-depth of not more than twenty fathoms. They cannot live in muddy or brackish water, or in regions where the mean temperature for any month falls below 68° F. The polyp also does not grow above the level of the lowest tides. As to the rate of growth of coral many observations and estimates have been made. Some species build up a reef as rapidly as three inches per year, others increase less than one inch in the same time. Alexander Agassiz estimates that the corals on the Florida coasts would construct a reef from the depth of seven fathoms to the surface in a period of from 1000 to 1200 years.

Under the special conditions necessary for the growth of coral it is a matter of interest to discover by what means the reefs and atolls have been formed, that often rise from depths of several hundred and even of thousands of feet. Darwin, who recognized the fact that shallow water was necessary for the living polyp, inferred that the sites of the reefs must have undergone a gradual subsidence, corresponding to the growth of the reef upward. According to his theory, the colonies of polyps first settled along the shores of an

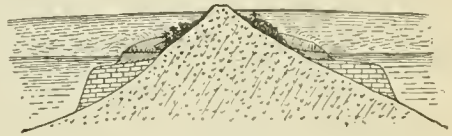


FIG. 1.

island, where after a time a fringing reef would be formed (Fig. 1). Then if the ocean floor subsided at a sufficiently slow rate to permit the growth of the coral to be continued on the outward side of the reef, the water-channel would gradually widen and deepen and a barrier reef (Fig. 2) would be formed, which, after a long



FIG. 2.

interval, upon the submergence of the entire island, would give way to an atoll (Fig. 3). This



FIG. 3.

simple explanation, first advanced by Darwin in 1835 and afterwards elaborated by J. D. Dana, found wide acceptance among geologists. It was soon discovered, however, that in certain cases the theory of submergence did not conform with the actual conditions. Semper, in 1868, directed attention to the Pelew Islands, where the sea floor and the reefs built thereon have actually

undergone elevation. Later, Murray pursued the study of the question still further and was able to show that reefs do not necessarily require a sinking shore for their formation, but they may grow on a stable foundation such as a submarine bank, raised to near sea-level by accumulation of fossil organisms, or the slopes of a volcanic island. After becoming established in such localities the corals continue their growth outward, and at the same time wave-action washes down debris from the reef to the bottom, forming a platform for their further activity. In case the original foundation was above sea-level the projecting portion may have been cut down by breakers. The solvent action of water would remove the dead coral from the interior of the reef and thus excavate a basin to be occupied by the lagoon. Both theories of reef-building are probably to be accepted as valid, and each must be tested by actual conditions before its application in any particular instance can be determined.

BIBLIOGRAPHY. Darwin, *The Structure and Distribution of Coral Islands* (New York, 1891); Dana, *Corals and Coral Islands* (New York, 1890); Agassiz, *A Visit to the Great Barrier Reef of Australia in the Steamer Croydon, in 1896* (Cambridge, Mass., 1898); Murray, "On Coral Reefs and Other Carbonate of Lime Formations in Modern Seas," in *Proceedings of the Royal Society of Edinburgh*, vol. xvii. (Edinburgh, 1891); Murray, "On the Structure and Origin of Coral Reefs and Islands," in *Proceedings of Royal Society of Edinburgh*, vol. x. (Edinburgh, 1880); Agassiz and Pourtales, *Monograph of the Corals of Florida* (Cambridge, Mass., 1871); Heilprin, *The Bermuda Islands* (Philadelphia, 1889). See ATOLL; CORAL.

COR'ALLI'NÆ, or **COR'ALLINE ALGÆ** (Lat. nom. pl. fem. of *corallinus*, made of coral, from *corallium*, *corallius*, coral). A group of red algae (Rhodophyceæ, q.v.), distinguished by the calcareous incrustations secreted by the thallus. The thallus is branching, usually articulated, and, with its limestone deposits, forms stony masses like those of the branching corals with which they are often associated. Coralline are important rock-making organisms in some formations, especially of Tertiary age, such as the granular limestone of the Paris basin, the lower Eocene of Ariège, and the nummulitic limestone of the Alps. The genus *Corallina* itself, now abundant, was rare during Tertiary time. Lithothamnium, however, appeared in Jurassic time, extending through the Cretaceous, was very abundant during the Tertiary, and has persisted to the present era with little change of its characters. Consult: Gümbel, "Die sogenannten Nulliporen, etc." *Abhandlungen der königlich bayerischen Akademie der Wissenschaften*, vol. ii. (München, 1874); Unger, "Beitrag zur näheren Kenntniss des Leithakalkes," *Denkschriften der Kaiserlich-königlichen Akademie der Wissenschaften zu Wien*, vol. xiv. (Vienna, 1858); Zittel and Schimper, *Traité de paléontologie*, part ii., *Paléophytologie* (Paris, 1891). See ALGÆ.

CORAL SEA (so named from its numerous reefs). A section of the Pacific, stretching between Australia on the west and the New Hebrides on the east (Map: Australasia, G 4). Soundings in 1874 gave an extreme depth of 14,700 feet.

CORAL-SNAKE. A poisonous serpent of the genus *Elaps*, common in tropical America, and

also represented in Africa, so called because coral-red is its prevailing color. There are many species, each marked by some different arrangement of black and yellow rings; the epidermis is also iridescent, probably due to laminations on the scales, and no more beautiful snakes exist. (See Plate with article SNAKE.) All are



CORAL-SNAKE OF FLORIDA.

small, of terrestrial habits, and provided with a poison apparatus sufficient for the killing of small animals and birds, but rarely fatal to man. A representative species (*Elaps fulvius*) is well known from Mexico to South Carolina, and common in Florida, as the 'coral-snake,' 'American cobra,' 'garter-snake,' and 'harlequin;' it is the only poisonous snake, not crotaline, in the United States, and, though small and gentle, is not safe to handle. Consult: *Report United States National Museum* (Washington, 1893), and Males and Urich, "Serpents of Trinidad;" in *Proceedings Zoological Society of London* (London, 1894). See CYLINDER-SNAKE.

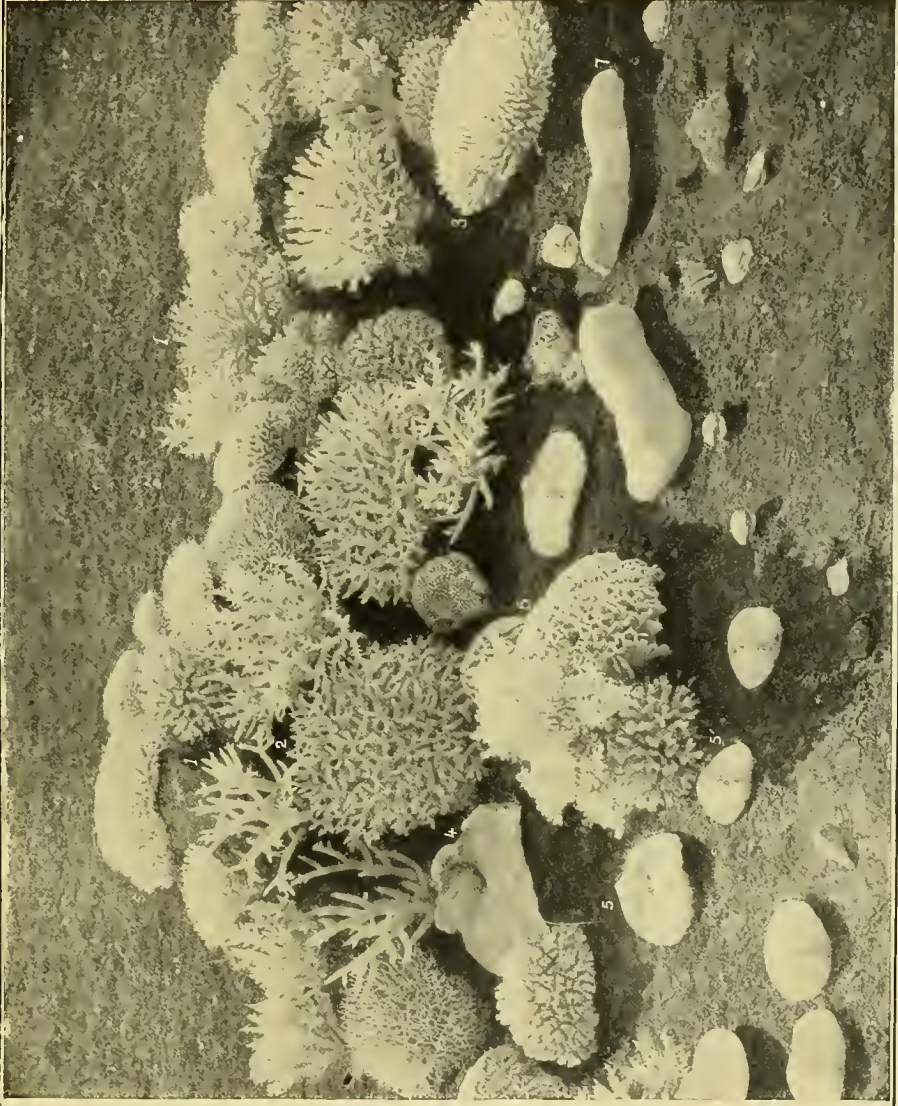
COR'AM, THOMAS (c.1668-1751). An English philanthropist, born at Lyme Regis, Dorsetshire. His father was a merchant captain and he was probably a shipwright by profession. He lived some time in Taunton, Mass. (c.1694-c.1716), and then settled in London about 1720. He was constantly interested in philanthropic schemes, particularly in the establishment of the Foundling Hospital, which was accomplished after many years of struggle. The institution was opened in Hatton Garden in 1741. Coram was also a promoter of the English settlements in Georgia and Nova Scotia. In later life he lost most of his fortune, and at his death was in possession of an annuity from the Government. He was buried in the chapel of the Foundling Hospital. One of Hogarth's best portraits is that of Coram, which has hung in the hospital since its presentation by the painter (1740).

CORAM'BIS. In Shakespeare's *Hamlet*, the name given in the quarto edition of 1603 to the character afterwards called Polonius.

CORANACH, kōr'ā-nāk, **CORONACH**, **CORANICH**, or **CRONACH** (Gael. Ir. *coranach*, from Gael. Ir. *comh*, with + Gael. *ranaich*, a crying, from *ran*, to cry out). A funeral dirge, formerly in use among the Irish and Scottish Celts. "The cries (coranich) are called by the Irish the ulagohne and hululu, two words extremely expressive of the sound uttered on these occasions (funerals); and being of Celtic stock, etymologists would swear to be the origin of the *ololumyon* of the Greek, and *ululatus* of the Latins."—Pennant's *Tour*.

The coranach seems to be identical with the Irish *caóine*, generally written and pronounced *keen*, a dirge for the dead, "according to certain loud and mournful notes and verses," wherein the pedigree, property, the good and great deeds of the deceased, and the manner of his death are recounted, in order to excite sorrow or revenge in the hearers, and to show them the loss they have sustained.

CORALS FROM THE GREAT BARRIER REEF, AUSTRALIA



1. STAGHORN CORAL (*Madrepora muricata*), etc.
2. A MADREPORE (*Madrepora formosa*).
3. A MADREPORE (*Madrepora convexa*).
4. A FUNGOID FORM (*Podobacia Crustacea*).
5. SEVERAL MUSHROOM CORALS (*Fungia lacerta*).
6. A RELATED SPECIES (*Mussa multiobata*).
7. *HERPETOLITHIA TALPINA*.

The word, in one or other of its forms, occurs in the writings of many of the ancient Scottish authors:

- "Cryand for you the cairfull corrinnoch,"
Sir D. Lindsay.
 "Cryand the corynoch on his,"
Battle of Harlaw.
 "Be he the correnoch had done shout,"
Dunbar.

The coranach has long since fallen into disuse among the Highlanders. The funeral lament performed on the bagpipes, which may be considered as an instrumental coranach, lingered on till the latter half of the eighteenth century.

For specimens of the coranach see Sir Walter Scott's *Lady of the Lake*, and accompanying notes; Crofton Croker's *Researches in the South of Ireland*; and *Blackwood's Magazine*, vols. xiii. and xxiii.

COR ANGLAIS, kōr ǎn'glá' (Fr., English horn). A wooden wind instrument of the double reed species, the body of which was formerly bent in the form of part of a circle, which accounts for its being called a horn. It is merely a large oboe (called in German *Altoboe*, i.e. alto of the oboe), and is usually played on by oboe-players. Its compass is two octaves and a fifth from E or E flat, fourth line in the bass, to B flat above the treble staff. It is a transposing instrument, and music for it is written a fifth above its real tones. Also the name of an eight-foot organ stop occasionally used in French and English pipe organs. For illustration, see **MUSICAL INSTRUMENTS**.

CORATO, kō-rá'tó. A city of Italy, in the Province of Bari delle Puglie, situated about 26 miles west of the city of Bari (Map: Italy, L 6). Not far from Corato are the ruins of the Castel del Monte, built by the Emperor Frederick II., in which the sons of Manfred (q.v.) were imprisoned. The town carries on a trade in cattle and leather, the surrounding country being well adapted for grazing. A good deal of tartar is manufactured here. Population (commune), in 1881, 30,552; in 1901, 41,573.

CORAY, kō-rá', **CORAIS**, or **KORAIS**, ΔΟ-ΑΜΑΝΤΙΟΣ (1748-1833). A Greek classical scholar and patriot. He was the son of a merchant in Smyrna. He engaged in trade in Amsterdam, but in 1782 went to Montpellier to study medicine and natural history. In 1788 he settled in Paris. Coray was one of the first to attempt to revive modern Greek literature, and his political tracts did much to arouse the Greeks to a successful revolt against Turkish rule. Of his classical works the most important is his edition of Heliodorus's romance, *Ethiopian Histories*, his commentaries on the writings of Hippocrates, and his editions of Xenophon's *Memorabilia*, Plato's *Gorgias*, and Strabo. His work, *Atacta, ou mélanges sur la littérature grecque moderne* (1828-35), did much to elevate the Greek vernacular to a literary language. Consult his *Autobiography* in Greek (Paris, 1833) and a Latin translation by Schultze (Liégnitz, 1834); also Simmer, *Life and Works of Korais* (Zurich, 1837); and Bywater, in *Journal of Hellenic Studies*, vol. i. (London, 1881).

COR'BAN (Heb. *qorban*, offering, from *qarab*, to draw near, to offer). A term used by the Jews to denote anything devoted to the Deity.

In the Priestly Code it is the regular word for an offering to God of any kind. Such an object was necessarily sacred and could not be applied to profane use. So the word came to be a general expression of prohibition and was used when there was no intention of devoting a thing to God. Certain of the schools held that the mere pronunciation of it, however rashly, constituted a vow. Hence it became a convenient makeshift to avoid a distasteful duty. Thus a son might say his money or other property was corban and so escape the obligation to use it for the support or need of a parent. This interpretation was rebuked by Jesus (Matt. xv. 5; Mark vii. 11.).

CORBELL, kōr'bá'y' (Lat. *Corbulinum*). A town in the Department of Seine-et-Oise, France, at the junction of the Essonne with the Seine, 18 miles south-southeast of Paris (Map: France, J 3). From the tenth to the twelfth century it was the chief town of a powerful countship. It was besieged by the Duke of Burgundy in 1418, by the Huguenots in 1562, and by Alexander Farnese in 1590. The Gothic Church of Saint Spire was rebuilt in the fifteenth century. The town has flour-mills, print-works, cotton-factories, and manufactures of watches, clocks, etc. Population, in 1901, 9362.

COR'BEL (OF. *corbel*, Fr. *corbeau*, basket, from Lat. *corbis*, basket). A bracket projecting from a wall and forming an integral part of it, so as to receive and support any superincumbent weight. In France it is not a corbel unless it has parallel sides and projects more than its height, but the English usage is more general and includes those slight projections, called in French *culs-de-lampe*, from which vaulting-ribs or moldings spring when they do not rise from the floor. See **BRACKET**; **CANTILEVER**; **CONSOLE**.

COR'BENIC. The name of a stronghold erected by Galafres after his conversion as a shrine for the Holy Grail. It is called also the Palace of Adventure, and in it Galafres, christened Alphasan, is stabbed to death.

COR'BETT, JULIAN STAFFORD (1854—). An English lawyer born in Surrey, and educated at Trinity College, Cambridge. He became counsel of the Navy in 1901. In addition to monographs on Sir Francis Drake and other English celebrities, in the work entitled, *English Men of Action*, he wrote the popular romances, *The Fall of Asgard* (1886); *For God and Gold* (1887); *Kophetua XIII.* (1809); and *A Business in Great Waters* (1895).

CORBIE, kōr'bé'. A town in the Department of La Somme, France, formerly a fortress, ten miles northeast of Amiens. It has cotton and woolen factories. Population, in 1901, 4133. Corbie owes its fame to the Benedictine abbey founded here in 662 by Queen Bathilde. The Abbot enjoyed the title of Earl and a munificent income. Of the abbey, the Church of Saint Pierre alone remains. The banished King Desiderius was sent here by Charlemagne in 774. Corvei (q.v.) owes its origin to Corbie.

CORBIE STEPS, **CORBEL STEPS**, or **CROW STEPS** (a Scotch corruption of *corbel steps*, from OF. *corbel*, corbel, but confused by popular etymology with Scotch *corbie*, crow, from ME., OF. *corbin*, Lat. *corvinus*, crow, and supposed to mean steps for crows). In architecture, the succession of steps with which the

gables of old houses are everywhere ornamented in Scotland. This gable ornament is by no means peculiar to Scotland and France, but is met with in Flanders, Holland, and all over Germany, where it is even more characteristic and general, especially in the brick architecture of North Germany—both of churches and of houses.

COR'BIN, HENRY CLARK (1842—). An American soldier, born in Clermont County, Ohio. In 1862 he entered the Union Army as a lieutenant in the Eighty-third Ohio Volunteers, but in the following month was transferred to the Seventy-ninth Regiment. He was major of the Fourteenth United States colored troops in 1863, lieutenant-colonel in 1864, and colonel in 1865, and remained with the Army of the Cumberland until the close of the war, when he was brevetted brigadier-general of volunteers. In 1866 he entered the regular army as a second lieutenant in the Seventeenth Infantry, and became captain in the Thirty-eighth Infantry in the same year. He was brevetted major and lieutenant-colonel, U. S. A., for gallantry at Decatur, Ala., and Nashville, Tenn., respectively (1867). Subsequently he was engaged in military duty in the far West. He was appointed major and assistant adjutant-general in 1880, lieutenant-colonel in 1889, and colonel in 1896. After a term of service at the Adjutant-General's office in Washington, and on Governor's Island as chief of staff in the Department of the East, he was appointed Adjutant-General of the army in 1894. During the war in Cuba he was involved in the criticism of the War Department, but in the reorganization of the army it was considered that he displayed industry and ability, and in 1900 he was, by special act of Congress, promoted major-general and adjutant-general, "this grade to expire with the termination of office of the present incumbent."

CORBOULD, kór'böld, EDWARD HENRY (1815—). An English painter, born in London. When only nineteen he painted "The Fall of Phaethon from the Chariot of the Sun," for which he received a gold medal from the Society of Arts. Since then he has produced a great number of large pictures. In 1851 he was appointed instructor of historical painting to the royal family, and as such he continued until 1872. He excels in pageants and chivalric subjects. Some of his well-known pictures are "Greek Chariot-Race," "Lady Godiva," "Héloïse," and "Canterbury Pilgrims."

COR'BULO, GNÆUS DOMITIUS (?-c.67 A.D.). A Roman general under Claudius and Nero; brother of Cæsonia, the wife of the Emperor Caligula. He commanded a successful campaign against the Parthians under Tiridates, but excited the jealousy of Nero, who gave orders for his execution. Upon hearing the Emperor's orders, Corbulo committed suicide. His account of his experience in Asia, which is mentioned by the Elder Pliny, has been lost.

CORCHORUS, kór'kô-rūs (Neo-Lat., from Gk. κόρχορος, *korchoros*, a wild plant of bitter taste). A genus of plants of the natural order Tiliaceæ, containing about thirty species, both shrubby and herbaceous, natives of the warm parts of the globe. *Corchorus olitorius* is widely diffused in tropical countries, and is supposed to be a native of Asia and Africa, and introduced into America. It is an annual, with a smooth, more or less

branching stem, varying in height from 2 to 14 feet or upward, according to soil and climate. It has smooth, stalked, alternate, oval, or ovate-lanceolate leaves, and small yellow flowers, solitary or in pairs. It is much used as a pot-herb, and is called Jews' mallow, from being much cultivated by Jews in Syria and other parts of the East. It is still more valuable for the fibre of its inner bark, as is also *Corchorus capsularis*, a species very similar, but distinguished by its capsule, which is short, globular, and wrinkled in *Corchorus capsularis*, and elongated and slender in *Corchorus olitorius*. Both are much cultivated in India, yielding the greater part of the jute (q.v.) of commerce, and of the fibre employed in making gunny bags (q.v.). *Corchorus capsularis*, being extensively cultivated in China, is sometimes called Chinese hemp. *Corchorus siliquosus* is a small American shrub, occurring from the West Indies southward. It is of little value. In Panama an infusion of its leaves is used instead of tea.

COR'CORAN, MICHAEL (1827-63). An American soldier. He was born at Carrowkeel, Ireland, emigrated to the United States in 1849, enlisted in the Federal Army at the beginning of the Civil War, and was taken prisoner at the first battle of Bull Run. Upon his exchange, he was commissioned brigadier-general in 1862, and organized the Corcoran Legion, which in 1863 checked the Confederate advance on Norfolk and was subsequently attached to the Army of the Potomac. He died as the result of a fall from his horse.

CORCORAN, WILLIAM WILSON (1798-1888). An American financier and philanthropist, born in Georgetown, D. C. He studied for a time at Georgetown College; became an exchange broker in Washington, and in 1840 formed a partnership with George W. Riggs. At the time of the Mexican War he took a large part of the Government loans, and financed them so skillfully as to lay the foundation of an immense fortune, which he used with liberality and munificence. He was the founder of the Louise Home for impoverished gentlewomen, the Oak Hill Cemetery at Georgetown, and the Corcoran Art Gallery, and made many liberal gifts to colleges and benevolent associations.

CORCORAN ART GALLERY. A collection of works of art, presented to the city of Washington, D. C., and heavily endowed by William Wilson Corcoran. The beautiful white marble edifice in Neo-Greek style, in which it is now lodged, was erected by Ernest Flagg in 1894-97. Besides the collections of paintings, sculptures, and ceramics, the building contains a school of art. Among the sculptures the famous "Greek Slave," by Powers, and the "Last Days of Napoleon I.," by Vela, are especially noteworthy.

CORCOVODA, kór'kô-vô'bâ (probably Peruvian in origin). A crane-like bird (*Psophia leucoptera*) of Peru and the upper Amazon, closely related to the trumpeter (q.v.). It is domesticated and has some curious and friendly habits, described at length in *American Museum of Natural History Bulletin*, vol. ii. (New York, 1887-90).

CORCY'RA. See CORFU.

COR'DA, AUGUST JOSEF (1809-49). An Austrian botanist, born in Reichenberg, Bohemia. At the age of twenty he published his *Monographia*

Rhizospermarum et Hepaticorum, and in 1834 was made one of the keepers of the Museum in Prague. In 1847 he came to Texas, where he carried out many interesting observations and collected a large number of valuable botanic specimens; but on his voyage home, in 1849, he was shipwrecked and drowned. His published works include, besides the *Monographia* already mentioned, the following: *Icones Fungorum Hucuscque Cognitorum* (6 vols., 1837-54); *Prachtflora europäischer Schimmelbildungen* (1839); and *Beiträge zur Flora der Vorwelt* (1845).

CORDAGE (from *cord*, Fr. *corde*, ML. *corda*, Lat. *chorda*, from Gk. *χορδή*, *chordē*, string; connected with Lat. *haru-specer*, inspector of entrails, Icel. *gorn*, OHG. *garni*, entrails, Lith. *zarnà*, Skt. *hira*, intestine, also Icel., OHG. *garn*, Ger. *Garn*, AS. *gearn*, Engl. *yarn*). A name applied chiefly to the running rigging of a ship and to the rope of which the rigging is made. See RIGGING; ROPE.

CORDAITES, *kōr'dā-ī'tēz* (Neo-Lat. nom. pl., named in honor of A. J. Corda). A genus of fossil plants, of the family Cordaitae, that shows intermediate characters between the conifers and the cycads. The genus appeared in Devonian time, reaching its maximum during the coal-measure period, when it was an important forest tree of the coal-swamp flora, and declined during the Permian. The tree grew to a height of thirty to fifty feet, with a trunk that branched freely, and it had dense foliage of parallel-veined leaves of lanceolate or linear form. These leaves are found in great abundance in some coal-measure shales, where they often lie packed in layers as do the fallen leaves of a modern forest. In the Middle Devonian of New Brunswick, Canada, a formation is called the 'Cordaites shale,' because of the number of Cordaites leaves it contains. The indorescence of Cordaites was separate as in the cycads, and the male and female elements were arranged in catkins placed in the axils of the leaves. The fructification is nut-like, resembling somewhat that of the yew or that of *Cycas revoluta* (a cycad), and has been described under the names *Cardiocarpum*, *Trigonocarpum*, etc. These fossil nuts are often exceedingly abundant. The trunk had a large pith, which often decayed to form a cavity of which the casts, known as *Artesia* and *Sternbergia*, are found on the dumps of some coal mines. The wood of the trunk, described partly as *Araucaroxyton*, has a microscopic structure remarkably like that of the conifers. Consult H. Graf zu Solms-Laubach, *Fossil Botany*, pp. 104-122 (Oxford, 1891). See CARBONIFEROUS SYSTEM; CYCADACEÆ; CONIFERÆ.

CORDAY D'ARMONT, *kōr'dā' dār'mān'*, MARIE ANNE CHARLOTTE (1768-93). The assassin of Marat, generally known as CHARLOTTE CORDAY. She was born at Saint Saturnin in Normandy. Her youth, passed in a convent, was spent in the reading of Plutarch, Rousseau, Raynal, Voltaire, and Corneille. Though she was noble by birth, she sympathized ardently with the cause of the Revolution in its early phases; but when the fall of the Girondists ushered in the Terror, she swung immediately to the opposite pole. She saw Barbaroux (q.v.) at Caen, spoke to him, and was convinced that Marat and Robespierre were the enemies of France. To the fervent student of the classics, the rôle of Brutus seemed a noble one, and she

determined to save the nation by murder. Telling her father that she was bound for England, she journeyed to Paris (July 1, 1793), inquired there for the house of Marat, pretending to be the bearer of a message, and bought a knife on the way. Twice delayed, she found Marat at last in his bath, writing (July 13). He had asked that morning, in the *Ami du Peuple*, for 200,000 heads, and Charlotte told him she could give him those of the Girondists at Caen. As he was setting down the names she uttered, one by one, she drove the knife up to the hilt into his heart; then she tried to escape. Marat died immediately, and the girl, quickly captured, and saved with difficulty from the mob, was taken to prison. Brought to trial and speedily condemned, she died calmly, going, as she said, to join the divine Brutus in the Elysian Fields (July 17, 1793). Consult: Dubois, *Charlotte Corday* (Paris, 1838); Vatel, *Charlotte Corday et les Girondins* (Paris, 1872).

CORDEIRO, *kōr-dā'é-rō*, JOÃO RICARDO (1836-82). A Portuguese dramatist. He was born in Lisbon, and in 1863 became secretary in the Conselho de Beneficencia. He was the founder of the periodical *Futuro*, and his numerous reports on charitable work contain valuable suggestions as to the most efficacious methods of dealing with the problem of poverty. In 1877 he obtained a Government position under the president of the Ministry, Luciano de Castro. His plays include: *Fernando* (1857); *Amor e arte* (1860); *A sociedade elegante* (1862); *A familia* (1869); *Osparaizos conjugues* (1882).

CORDE/LIA. In Shakespeare's *King Lear*, the youngest daughter of the King, by whom she is disinherited for not making sufficiently effusive protestations of love for him. But when he is turned out by his other daughters, Goneril and Regan, she comes to his rescue with an army. She is taken prisoner, and killed in prison.

CORDELIERS, *kōr'd'lyā'* (Fr., cord-wearers). The name given in France to the most austere branch of the Franciscan friars, on account of the girdle of knotted cord they wore. After 1790 the name was applied to the members of a political club which assembled in the abandoned chapel of a Franciscan monastery, and exercised great influence on the progress of the Revolution in Paris. Its leaders were men of various opinions, Danton, Camille Desmoulins, Marat, Hébert, and the picturesque Anacharsis Clootz. It drew its strength from the very lowest classes of Paris, and always had an armed mob at hand ready for insurrections. The members of the Cordeliers were the first to demand a republic, took a very prominent part in the events of the tenth of August, 1792, and chiefly contributed to the overthrow of the Girondists (q.v.). While the club was at the height of its influence, Desmoulins began the publication of his popular journal *Le Vieux Cordelier*. Later, the spirit of the Cordeliers became so violent as to out-Jacobin the Jacobins, and men like Danton and Desmoulins abandoned it. In 1794 the Cordeliers awakened the enmity of Robespierre, who determined to crush them. On March 24 and April 5 most of the leaders were guillotined, and the club practically came to an end. Consult Bougeart, *Projet d'organisation des Cordeliers* (Paris, 1870).

CORDER, FREDERICK (1852—). An English musician, born in London. He studied at

the Royal Academy of Music, London, gained the Mendelssohn scholarship in 1875, and, after studying in Cologne under Ferdinand Hiller, returned to London, and in 1880 became conductor of the orchestra at the Brighton Aquarium. His works include *Morte d'Arthur*, opera (1877); *In the Black Forest*, suite for orchestra (1876); *The Bridal of Triermain*, cantata (1886); Rumanian suite for orchestra (1887); *The Minstrel's Curse*, declamatory ballad, with orchestra (1888), and *The Sword of Argantyr*, dramatic cantata (1889). With his brother Henry, he translated the libretti of Wagner's music dramas into English. In 1896 he lectured on Wagner, Berlioz, and Liszt, before the Royal Academy. He published a valuable theoretical work, *The Orchestra and How to Write for It* (London and New York, 1896).

CORDE'RIOUS, or **CORDIER**, kôr'dyâ', MATHEURIN (1479-1564). A French humanist, author of the *Colloquia*. He was especially fond of teaching children, and taught in Paris, where he had as one of his scholars John Calvin, who dedicated to him the commentary on the *First Epistle to the Thessalonians*. He subsequently taught in Geneva. He wrote a number of books for children, one of which, *Colloquiorum Scholasticorum Libri Quattuor ad Pueros in Latine Sermone Exercendos* (1564), appeared in numerous later editions and was translated into English and French.

CORD GRASS (*Spartina*). A genus of grasses having compound spikes, the species of which are found in wet places, many of them in salt or brackish tide marshes. The spikelets are arranged on one side, and have only one perfect floret and very unequal glumes. The species are perennial, rigid, from creeping rootstocks, and have long, tough leaves, hence the name cord grass. *Spartina striata*, found in muddy salt-marshes on the east and southeast coasts of England, and in America, although remarkable for its extreme stiffness and rigidity of habit, is used for making ropes, on account of the toughness of its fibre. *Spartina cynosuroides* and *Spartina patens* are common in the United States, the former along the ocean and lake shores from Maine to the Pacific; the latter species is common in salt-marshes, and this and *Juncus Gezardi* furnish the best of the marsh-hay. *Spartina cynosuroides* has been successfully used in the manufacture of twine and paper. It is recommended as a binding grass for wet banks, ditches, etc.

COR'DIANI. See SANGALLO.

CORDIER, kôr'dyâ'. HENRI (1849—). A French Orientalist, born in New Orleans. He studied in France and England, and in 1869 went to China, where he spent eleven years. He became professor of the School of Political Science in Paris in 1886, and professor of history, geography, and Eastern legislation at the School of Living Oriental Languages. His works include *Bibliotheca Sinica*, a bibliographical dictionary of books about the Chinese Empire (1878-95); *La France en Chine* (1882); *Recueil de voyages et de documents pour servir à l'histoire de la géographie depuis le XIII^e siècle jusqu'à la fin du XVI^e siècle* (1882-85), and an *Atlas sino-coréen* (1896).

CORDIÈRE, kôr'dyâr', LA BELLE (Fr., the beautiful rope-maker). A nickname of the

poetess Louise Labé, whose husband was Perrin, a rope-maker.

CORDIERITE, kôr'di-ēr-īt. See IOLITE.

CORDIL'ERA. A general term applied to the system of elevations that extends along or near the Pacific Coast of North and South America from northern Alaska to Cape Horn. The Cordillera of North America includes the mountain ranges in Mexico, the Rocky Mountains, the Sierra Nevadas, the Coast and Cascade ranges in the United States, and the several ranges in British Columbia and Alaska. The whole western part of the continent traversed by these ranges is commonly called the 'Cordilleran region.' In South America the term is sometimes used comprehensively as a synonym for the Andes, or the two may be united, i.e., Andean Cordillera, and it is also applied to definite portions of the Andes, as in Colombia, where the three mountain ranges are known as the Eastern, Central, and Western Cordilleras. The term, originally borrowed from the Spanish, is being used more and more by geographers in a general sense to signify an extensive system of elevations. See AMERICA; ANDES; etc.

CORDITE (from *cord*, on account of the appearance of the grains). A form of smokeless gunpowder used in England. It is composed of nitrolycerin, 58 parts; nitrocellulose, 37 parts; vaseline, 5 parts. It is colloidized by dissolving the nitrocellulose in a solvent, incorporating the ingredients, and then evaporating the solvent. See EXPLOSIVES.

CÓRDOBA, kôr'dô-bâ, or **COR'DOVA**. The flourishing capital of the province of the same name in Argentina, on the Río Primero, a tributary of the Paraná (Map: Argentina, E 10). It is situated at an elevation of about 1200 feet, and is regularly laid out and well built, except on the surrounding heights, which are inhabited mostly by the poorer classes. The city has a fine park, or promenade, and plazas, in the principal of which is situated the cathedral, an imposing structure of composite architecture with a fine cupola, dating from the seventeenth century. The Government palace is also worth mentioning. An equestrian statue of General Paz stands in the plaza of that name. Among the educational institutions are the university—founded by the Jesuits in 1613, thus ranking in age next to that of Lima—a national college, two seminaries, and an observatory and meteorological station. Other features of Córdoba comprise a public library, a well-equipped general hospital, asylums for orphans and the poor, etc. The city is an episcopal see. Though the surrounding country is rendered fertile only by irrigation, Córdoba is an important commercial centre, owing to its geographical position. Live stock, wool, and hides are the chief exports of the vicinity, and beds of ealcite are worked. The city has some industrial interests, principally manufactures of building material, lime, bricks, and flour. Population, in 1901, 50,000. Córdoba was founded in 1573, the neighborhood having been visited some thirty years before by an officer of Pizarro, and, after becoming the capital of Tucumán, rose to prominence as an educational centre and as the headquarters of the Jesuits in that region. It suffered to some extent in the revolutionary struggles. In 1871 Córdoba was the seat of the first national exposition of Argentina.

CORDON (Fr. *cordon*, from *corde*, cord). A military term for a line of sentries, posted within view of each other, and designed to prevent forbidden contact or communication between one side of the line thus guarded and the other. When large separate bodies of troops are so disposed as practically to shut in a section of country, they are spoken of as a cordon of troops. Country inclosed by a series or system of block-houses, as in South Africa under General Kitchener (1901), is described as *cordoned*. A cordon instituted to prevent contagion from an infected place or district is a *cordon sanitaire*.

CORDON. A system of training by which a plant that is naturally diffusely branched is made to grow as a single stem in order to induce large fruits. Trees trained as cordons may have one or two stems trained horizontally or obliquely; if two stems are retained these are carried horizontally in opposite directions about 18 inches from the ground, or they may be carried obliquely and parallel; the laterals of such branches being kept spurred. Any plant which bears its fruit upon spurs will, therefore, lend itself to this style of training.

CORDON BLEU, kôr'dôn' blē (Fr., blue ribbon). Knights of the ancient French Order of the Saint Esprit, or Holy Ghost, were so called because the jewel of the Order was suspended on a blue ribbon. In late times the term was degraded to mean a first-rate cook. The *cordon grand* is any member of the Legion of Honor, the decoration being suspended by a broad ribbon.

CORDOVA, kôr'dô-vâ, or **CÓRDOBA**, kôr'dô-bâ (Lat. *Corduba*, from Phœnician *Kartatubâ*, Great City). A city of Spain, and capital of the Province of Cordova, situated on the Guadalquivir, 120 miles by rail north of Malaga (Map: Spain, C 4). It lies at an altitude exceeding 390 feet at the base of the Sierra de Cordova. In appearance the city is less characteristically Moorish than might be supposed, its aspect being one rather of heterogeneity arising from the conglomerate architecture of various periods; it retains but few marks of the Saracen period, and but faintly recalls the grandeur of the former metropolis of Mohammedan Spain. The streets are with few exceptions narrow and crooked, and the houses gloomy. The finest edifice is the cathedral, once the chief mosque of the 'Infidels,' and one of the most splendid examples of Moorish architecture. Together with the court, it occupies a site 570 feet by 425 feet, with a bell-tower 300 feet in height. It is surrounded by a wall with strong buttresses, and was originally both mosque and fortress. The interior is almost a labyrinth of pillars, for they number some 850, in various styles and mostly of marble, porphyry, and jasper. The building has suffered considerably through the changes of different epochs, made in the endeavor to convert the mosque into a Christian cathedral. A short distance from the cathedral, to the south, stands the marble triumphal column, erected 1765, of San Rafael, the patron saint of Cordova. Among the Moorish remains are the ruined city walls, part of the Alcázar, and the old bridge of 16 arches, 730 feet long, connecting Cordova with its suburb, Campo de la Verda. The bridge, originally built by the Romans, was reconstructed on the same foundations by the Saracens. Cordova contains a large num-

ber of churches and convents, a bishop's palace, a theatre, and a bull-ring. The educational institutions include a lyceum, a theological seminary, a veterinary school, and a library.

Once a great centre of commerce, Cordova is in a state of decline, her local industries suffering in the general stagnation of the country. The railroad connection with Seville, Malaga, and Madrid brought in a little new life, but Cordova is still a city of the Middle Ages. There are manufactures of leather, liquors, hats, cloth, silk, and paper, besides the ancient silver-filigree industry for which Cordova has long been famous. Iron is mined in the vicinity. Population, in 1900, 56,097.

Cordova is said to have been founded by the Phœnicians, but was acquired B.C. 152 by the Romans. It rose to be the second city of Spain, the seat of a prætor and a supreme tribunal, and a centre of industry. Taken by the Goths in the sixth century, it fell in 711 into the hands of the Saracens. In 756 the city became the capital of an Omniad realm, which existed till 1031 and embraced all Mohammedan Spain. This State, whose rulers at first were content with the title of *Emir* and finally assumed that of *Caliph*, rivaled in splendor the Eastern Caliphate of Bagdad. From the ninth century to the twelfth Cordova was one of the greatest centres of commerce in the world. According to Arabian historians the city at the height of its splendor contained 200,000 houses, a million inhabitants, 600 mosques, 80 institutions of learning, and a public library with 600,000 volumes. Such accounts are doubtless exaggerations, but certainly when all was dark over the rest of the Occidental World, Cordova held aloft the light of civilization. After the fall of the caliphate the decline was rapid; the city was taken by Ferdinand III. of Castile in 1236 and never afterwards regained its prosperity. Cordova was plundered by the French under Dupont in 1808. It is noted as being the birthplace of the two Senecas, the poet Lucan, and the philosopher Averroës.

CÓRDOVA, FERNANDO FERNANDEZ DE (1792-1883). A Spanish commander and statesman, who began military service in 1810, and served in the wars against Napoleon. In 1841 he was implicated with Concha in the conspiracy against Espartero; in 1847 he was Minister of War, and afterwards was inspector-general of infantry. He was Captain-General of Cuba in 1850. In 1853 he was made general-in-chief of cavalry. He attempted to support Isabella in the outbreak of 1854, but when revolution became successful he fled to France. He returned a few years later, and in 1864 Narvaez made him Minister of War. In 1868, in common with most of the Spanish grandees, he took part in the Prim revolution against Isabella. In 1870 he was again appointed Captain-General of Cuba, and in 1871 he was made Minister of State *ad interim* at Madrid by King Amadeus. On the proclamation of the Republic he was named Minister of War.

CÓRDOVA, FRANCISCO HERNANDEZ (c.1475-1526). A Spanish soldier and explorer. He accompanied Pedrarias to Castilla del Oro, Panama, in 1514, and in 1524 was sent by that commander to take possession of Nicaragua, ignoring the rights of the discoverer, Gil Gonzalez Davila. After exploring the country and founding several important settlements, he endeavored

to sever his allegiance to Pedrarias and to establish a government of his own. Upon being informed of the treachery of his lieutenant, Pedrarias personally conducted an army into Nicaragua, and after defeating Córdova in battle, ordered his execution.

CÓRDOVA, GONSALVO DE. See GONSALVO DE CÓRDOVA.

COR'DOVAN, or **CORDUAM**. A species of leather prepared from goat-skins or split horsehide, and used throughout Europe during the Middle Ages for the boots of the wealthy. It was originally, and at one time exclusively, manufactured by the Moors of Cordova, and hence its name.

CORDOVA Y FIGUEROA, é ié'gá-rū'á, PEDRO DE (1692-c.1770). A Chilean historian, born at Concepcion. He entered the army in 1725. In 1739, by order of President Velasco, he founded Los Angeles, the capital of Aracania. About 1745 he wrote a history of Chile from the conquest until 1717. It has been published in the *Colleción de historiadores de Chile*, and was long regarded as the highest authority on the subject.

COR'DUROY (probably for Fr. *corde du roi*, King's cord). A cotton material having a cut pile like velvet, but with the surface ribbed. The gut or division which separates the ribs is produced by binding the pile weft to the cloth. See FUSTIAN.

CORDUROY ROAD. A roadway in marshy places formed by laying logs side by side. It takes its name from its rough or ribbed surface, resembling corduroy. This method of road-building is rarely employed now except for temporary purposes, as in military operations. It is still in use, however, in sparsely settled regions where nothing better can be afforded. See ROAD; ROADS AND RAILROADS, MILITARY.

COR'DUS, CREMUTUS. A Roman historian, who in A.D. 25 was, according to Tacitus (*Annales* iv., 34, 35), accused before Tiberius of having praised Caesar's assassin, Brutus, and of having termed Cassius the 'last of the Romans.' The true cause for this accusation, however, was his free expression of opinion regarding Sejanus, the influential minister of Tiberius (q.v.). Having pronounced an apology, he, anticipating no favor from the Emperor, starved himself to death. Some copies of his works escaped destruction by the officials, but there are now extant only a few fragments preserved in the *Suasoriae* of Seneca. Consult Rathlef, *De Cremutio Cordo* (Dorpat, 1860).

COR'DYLINE. See TL.

CORE (OF. *cor*, Fr. *corur*, from Lat. *cor*, heart). In masonry, the central portion of any heavy part of the structure, such as pier, buttress, main wall, etc., which is not visible, but is covered with a sheathing or surface of another material. Roman buildings have a concrete or rubble core, with a facing of brick or coarse stone construction; sometimes of marble slabs or stucco. In mediæval structures the core is sometimes of brick, with stone facing.

COREA. See KOREA.

COREAL, kó'rá-ál'. FRANCISCO. Probably the pseudonym of an author who in 1722 published a book entitled *Voyage aux Indes*. According to the statements of the author, he was born in

Cartagena, Spain, in 1648, and spent more than thirty years in travel, chiefly in the Caribbean region and in South America. The work passed through several editions, one of the most important of these being published in Brussels in 1736. The numerous errors which it contains and the doubts which have been cast upon its authenticity justify the belief that it was a pseudonymous publication.

CORELLI, ARCANGELO (1653-1713). An eminent Italian violinist and composer, surnamed *Il Divino*. He was born at Fusignano, near Bologna, and studied in Rome under Bassani and Matteo Simonelli. He is said to have been in Paris in 1672, and subsequently passed several years in Germany in the service of the Elector of Bavaria. In 1681 we find him settled in Rome, where he found a generous patron in Cardinal Ottoboni, and soon acquired fame as a virtuoso, teacher, and composer. He was especially admired for the beauty of his tone and expressive execution, and laid the foundation for the development of superior violin technique. His compositions rank among the best of his time and continue to this day models of classical study in instrumental music. The finest and most famous among them are twelve *Concerti grossi*, op. 6 (1712).

CORELLI, MARIE (1864—). An English novelist, the adopted daughter of Charles Mackay, the poet. She was born in Italy and educated in London and in a convent in France. A musical career was planned for her, but she early adopted literature instead. Among her writings are: *The Romance of Two Worlds* (1886); *Thelma* (1887); *The Sorrows of Satan* (1895); *The Mighty Atom* (1896); *The Murder of Delicia* (1896); *Ziska* (1897); *Jane* (1897); *The Master-Christian* (1900); *Boy* (1900); and *Temporal Power* (1902).

CORENTYN, kó'rén-tén' (Dutch *Corantyn*). A river of Guiana, South America. It rises on the boundary of Brazil and flows in a northerly direction and empties into the Atlantic. Throughout its length it forms the boundary line between British and Dutch Guiana (Map: Guiana, F 3). It is navigable for a distance of over 40 miles for large steamers, while light vessels can ascend as high as 170 miles from its mouth, where navigation is interrupted by cataracts, which occur at a number of points on its middle and upper course.

COR'EOP'SIS (Neo-Lat., from Gk. *κόρις*, *koris*, bedbug + *opsis*, appearance). An herbaceous annual or perennial plant of the order Compositæ, nearly all natives of eastern North America, and popularly known as tick-seed, the fruit being in the shape of a small tick. It is often raised for its showy yellow or rose-purple flowers with yellow or brown disks. The perennials are grown in hardy borders; the annuals in the garden in almost any soil. For illustration see Plate of CRANBERRY.

CORFE (kôrf) **CASTLE**. A village of Dorset, England, in the middle of Purbeck Isle or Peninsula, 24 miles east-southeast of Dorchester (Map: England, D 6). In the vicinity are stone and marble quarries, and clay-works for potteries. Population of parish, in 1901, 1967. A castle, giving its name to the village, stands on a neighboring hill. Founded in the tenth century, it was long

one of the strongest fortresses in the kingdom. Here King Edward the Martyr was murdered by his step-mother, Elfrida, in 979, and King John, during his disputes with his barons, kept his regalia here for safety. In 1642 Lady Bankes defended the castle for six weeks against Charles I. It was dismantled by Fairfax in 1645.

CORFLAM'BO. In Spenser's *Færic Queen*, a giant representing licentiousness.

COR'FU (Gk. *Κόρυφα*, *Korkyra*, or *Κέρκυρα*, *Kerkyra*, Lat. *Corecyra*). The most northerly of the Ionian Islands (q.v.). in latitude 39° 20' to 39° 50' N., longitude 19° 40' to 20° 10' E. It has a length of about 38 miles, with a breadth varying from 3 or 4 to 20 miles. Area, 275 square miles. Population, in 1896, 90,872. Like the rest of the Ionian Islands, it is mountainous, and the mountains are generally naked and dry, the highest summit, Pantokrator, being about 3000 feet above the sea. The valleys, however, are very fertile, and yield olive-oil, wine, honey, oranges, figs, etc. Salt is also produced in some quantity. The climate is generally mild and healthful. The principal town, Corfu, on the east, situated on an elevation, has some good streets, and a fine esplanade. It has about 25,100 inhabitants and a considerable trade. It is the seat of a Greek archbishop and of a Catholic bishop. The early history of the island is purely mythical, as the later inhabitants identified it with the Homeric Scheria (Phæacia). About B.C. 734 the Corinthians are said to have colonized the island, which, however, soon attained such wealth and maritime power as to assert its independence. After the Persian wars, in which Coreyra took no part, a further dispute with Corinth led the Coreyreans to ally themselves with Athens, and the intervention of the latter city was one of the factors which contributed to the outbreak of the Peloponnesian War. Internal dissensions and varying foreign control marked the history of the island until it was taken under Roman protection in B.C. 229. During the greater part of the Middle Ages it formed part of the Byzantine Empire, and later passed into the possession of the Venetians, who held it in spite of two fierce attacks by the Turks, until 1797. Since that time Corfu has shared the fortunes of the other Ionian Islands. Consult: Riemann, *Recherches archéologiques sur les îles ioniennes*, vol. i., *Corfou* (Paris, 1879); and Partsch, *Die Insel Korfu* (Gotha, 1887).

CORI, *kō'rē*. A city in the Province of Rome, Central Italy. 36 miles southeast of Rome (Map: Italy, G 6). Important to the antiquarian are the huge polygonal blocks that formed the walls of the ancient Cora—a city that was an early member of the Latin League and that had for traditional founder the Trojan Dardanus or Coras; also the ruins of a temple of Castor and Pollux and of a so-called temple of Hercules. Population (commune), in 1881, 6300; in 1901, 7363.

COR'RIAN'DER (Lat. *coriandrum*, Gk. *κόριαννον*, *koriannon*, *κόριον*, *korion*, coriander, possibly from *κόρις*, *koris*, bedbug, referring to the smell of the leaves), *Coriandrum sativum*. An annual or biennial plant of the natural order Umbellifera, with branching stem, one to two feet high, the lower leaves bipinnate, the upper leaves more compound, divided into very narrow

divisions, and with globose fruit. It is a native of the south of Europe and of the East, and has long been cultivated for the sake of its fruit. It has thus become naturalized in some parts of England and the United States, where its fruit, coriander-seed, is much less used than in Germany and some other European countries. The whole plant, when fresh, has a very offensive smell, due to an essential oil, but the ripe and perfectly dry fruit has an agreeable aromatic smell and a sweetish aromatic taste. It is used in medicine as a carminative, and in domestic economy as an aromatic, being very often mixed with bread in the north of Europe; spirituous liquors are flavored with it; and confectioners cover it with sugar, to make a well-known kind of confection. In the south of England it is common to sow coriander and caraway together, the coriander yielding a crop in the first year, and the caraway in years following. Coriander delights in a rich soil and is much cultivated and used in India. It is little used in the United States.

CORIGLIANO CALABRO, *kō'rē-lyā'nō kā-lā'brō*. A city in the Province of Cosenza, South Italy, four miles from the Gulf of Taranto and 85 miles southwest of Taranto (Map: Italy, L 8). It has a castle and an aqueduct, and markets a high quality of manna from the ash-trees of the surrounding country. Population (commune), in 1881, 13,272; in 1901, 13,320.

COR'IN. In Shakespeare's *As You Like It*, a shepherd who offers his services to Rosalind and Celia as a 'faithful feeder.'

CORIN'NA (Gk. *Κόριννα*, *Korinna*). A Greek lyric poetess, nicknamed 'The Fly' (*Mvta*, *Myia*), famous alike for her beauty and for her genius. She was born at Tanagra, in Bœotia. The date of her birth is not known, but she was an elder contemporary and, according to tradition, a rival of Pindar. Elian and Suidas speak of her five victories over him, and Pausanias saw at Tanagra a picture of her wearing about her head a fillet of victory, which he supposes she gained in a contest with her younger rival. An anecdote has been preserved by Plutarch, relating that when Pindar had been advised by her to embellish his poems with mythology, he produced a hymn to Thebes in which all Theban mythology was alluded to in the first six verses; whereupon she advised, "Sow with the hand, not with the full sack." Her poems were all in the Bœotian dialect. The fragments are edited by Bergk, *Poetæ Lyrici Græci* (Leipzig, 1900).

CORINNA. (1) A name given by Dryden to Mrs. Elizabeth Thomas, with whom he had a correspondence. She afterwards made the acquaintance of Curll, the notorious publisher, and furnished him with a selection of letters interchanged between herself and Dryden. They were probably fictitious. (2) The daughter of Gripe in Van Brugh's comedy *The Confederacy*.

CORINNE, OU L'ITALIE, *kō'rēn' ou lē-tā'lē'* (Fr., Corinna, or Italy). The most important novel of Madame de Staël, published in 1807, named from its heroine, who pines and dies after her lover proves false.

CORINTH (Gk. *Κόρινθος*, *Korinthos*; said to have been called in early times Ephyra). An ancient city of Greece, situated at the south end of the isthmus connecting the northern division of Greece with the Peloponnesus. Its

citadel was the Acrocorinthus, an isolated hill 1886 feet high, with precipitous sides, and commanding one of the finest views in Greece. At the northern foot of this hill lay the city of Corinth, on a broad terrace nearly 200 feet above the level of the isthmus. In the Homeric epic *Ephyra* is mentioned as the home of Sisyphus and Bellerophon, but the city does not seem to have played a great part in the heroic age, and appears in dependence upon the rulers of Mycenæ, with which place it was connected by a very early system of roads. Discoveries of pre-Mycenæan pottery in graves show that there was a settlement at the foot of the Acrocorinthus in very early times, but as yet few remains of the Mycenæan age have come to light. The growth of the city seems to have occurred after the Dorian conquest of the Peloponnesus, and to have been especially favored by the development of the intercourse with the west: for this its situation with harbors on both the Corinthian and Saronic gulfs gave it peculiar advantages, which were further enhanced by alliances with Samos and Chalcis on Eubœa. By the end of the eighth century B.C., Corinth was the chief trading city of Greece, and the extent of its trade is shown by the number of Corinthian vases found in Italian graves, as well as by the testimony of ancient writers. Among the colonies founded by Corinth at this period was Syracuse. The government was a strict oligarchy under the leadership of the family of the Bacchiadæ, but when, early in the seventh century B.C., Coreyra successfully maintained her independence of the mother city, a revolution occurred, and Cypselus became tyrant (c.657 B.C.). Under his rule and that of his son, Periander, the prosperity of the city increased, Coreyra and Epidaurus were reduced, and the establishment of Potidæa on the northern coast of the Ægean gave Corinth a share in the rich trade of Macedon and Thrace. About B.C. 582 the tyrants were overthrown, and a moderate oligarchy established, which seems to have remained as the usual form of government, though occasionally interrupted by democratic revolutions. Like the other cities of Peloponnesus (except Argos), Corinth became a member of the Lacedæmonian League, and played her part in the Persian wars. The great development of Athenian power was a serious blow to the commercial interests of Corinth, and accordingly we find the city active in promoting the Peloponnesian War. After the fall of Athens, the Corinthians became jealous of the Spartan rule, and formed an alliance with Thebes and Athens, which led in B.C. 395 to the Corinthian War. Later, Corinth returned to the Spartan alliance, and supported the city in the war waged with the Thebans under Epaminondas. Three years after the battle of Chæronea (B.C. 338), it was garrisoned by the Macedonians, who held it until B.C. 196, with the exception of B.C. 242 to B.C. 223, when it was occupied by Aratus for the Achæan League. When the freedom of Greece was proclaimed by the Romans, Corinth was restored to the Achæan League. Having become the centre of the last uprising of Greece against the Roman power, it was utterly destroyed (B.C. 146) by L. Mummius, the Roman general, and for a whole century it continued in ruins. In B.C. 46 Julius Cæsar rebuilt it, and it afterwards became the capital of the Roman Province of Achaia; and although it never again

attained its early importance, it became both prosperous and powerful. Saint Paul planted a Christian church here, to which he addressed two epistles. In A.D. 1458 it was conquered by the Turks under Mohammed II., was taken by the Venetians in 1687, and retaken by the Turks in 1715, who held it till 1823. Reduced to ashes in the Revolutionary War, and again utterly destroyed by an earthquake in 1858, Corinth is now rebuilt in a more convenient position on the shore of the Gulf of Corinth. Ancient Corinth was surrounded by walls, having a circuit of about four and one-half miles, or, including the Acrocorinthus, of eight miles. It had two harbors—*Lechaum*, on the Gulf of Corinth (q.v.), and *Cenchrea*, on the Saronic Gulf, opening into the Ægean. The former was connected with the city by two parallel walls. The wealth and prosperity of Corinth made it the seat of luxury and licentiousness. Besides the sea deities Poseidon and Amphitrite, Aphrodite claimed a large share in the religion of the city, and her temple alone is said to have had 1000 courtesans as sacred slaves. The Corinthian *hetæra* were famous throughout Greece. In the earlier period Corinth was famous for its work in clay and bronze, and even in later times 'Corinthian bronze' was almost as precious as gold. Though devoted to art, and filled with costly paintings and statues at the time of its capture by Mummius, the city does not occupy a prominent place in either art or literature, and but few Corinthians except Periander and Timoleon appear among the famous names of Greece. Before 1896 the chief remains of ancient Corinth were the foundations on the Acrocorinthus and the seven columns of a very early Doric temple, probably of the time of Periander. In 1896 excavations were begun by the American School of Classical studies at Athens, and although few works of art or inscriptions have been found, the discoveries have furnished a sure basis for the topography of the ancient city, of which the traveler Pausanias (q.v.) gives a detailed description. The chief sites determined are the Theatre, the Fountains of Pirene and Glauce, the road to Lechaum, the Propylæa, and the Agora to which it led, and the identification of the old temple with the Temple of Apollo. The mediæval walls are still in a fair state of preservation. Consult: E. Curtius, *Peloponnesos* (Gotha, 1851-52); Wilish, *Beiträge zur inneren Geschichte des alten Korinth* (Zittau, 1887); id., *Geschichte Korinths von den Perserkriegen bis zum dreissigjährigen Frieden* (Zittau, 1896); these pamphlets contain also a bibliography of Corinthian history. The reports of the American excavations are published in the *American Journal of Archaeology*, 2d series, vol. i., et seq. (New York, 1897), a popular account by Director Richardson, in the *Century Magazine* (New York, 1899); and by Cooley in *Records of the Past*, I. (Washington, 1902).

CORINTH, or **NEW CORINTH**. An episcopal city and seaport of Greece, situated on the north coast of the Isthmus of Corinth, three and one-half miles northeast of the ancient city (q.v.) and one and one-half miles southwest of the northern terminus of the Corinth Canal (Map: Greece, D 4). Corinth is about 55 miles west of Athens. The town was founded in 1858 after the destruction of the vestiges of old Corinth by an earthquake. It is wholly a modern town and has wide streets. It is connected by rail with

Athens, Patras, and Argos. It has a good harbor. There are a custom-house and a gymnasium. It has been prospering since the Corinth Ship Canal was opened in 1893. Among its exports are oil, honey, silk, corn, and currants. It is the capital of the nomarchy of Corinth, and has a population of about 5000.

CORINTH. A city and county-seat of Alcorn County, Miss., near the Tennessee border, 90 miles east-southeast of Memphis, Tenn., on the Mobile and Ohio and the Memphis and Charleston railroads (Map: Mississippi, J 1). Population, in 1890, 2111; in 1900, 3661.

At the outbreak of the Civil War, Corinth, being at the junction of the Mobile and Ohio Railroad running north and south, and of the Memphis and Charleston running east and west, became a point of great strategic importance. It was fortified by the Confederates, and immediately after the battle of Shiloh (April 6, 7, 1862) General Beauregard with 50,000 men retreated thither, followed by General Halleck at the head of a force of over 100,000 men. Halleck advanced with great caution, being more than a month in covering a distance of only 23 miles, and when he approached Corinth, Beauregard, after slight skirmishes, quietly evacuated the place during the night of May 29th, Halleck taking possession the following day. On October 3, 4, 1862, a force of 22,000 Confederates under Generals Van Dorn and Price attempted to recapture the place, then defended by General Rosecrans with 20,000 troops. But the assailants, notwithstanding the heroic valor displayed, were repulsed with great loss. The Union loss was 315 killed, 1812 wounded, and 232 missing, while that of the Confederates (estimated) was 592 killed, nearly 2000 wounded, and 2225 prisoners.

CORINTH, GULF OF, or GULF OF LEPANTO. An arm of the Mediterranean extending from west to east through the centre of Greece, and dividing the Peloponnesus from the northern mainland. The outer portion extends from the promontory of Araxus (now Kalogria) in Achaëa to the narrow strait (1¼ miles) between Rhion and Antirrhion (south and north shores), the inner from this point to the isthmus, a distance of about 80 miles. The gulf has the appearance of an inland lake, and the scenery is remarkably attractive, since the shores show striking contrasts of rocky promontories and fertile plains, while the background is everywhere marked by lofty mountains. The narrow neck of land which separates the Gulf of Corinth from the Saronic Gulf, and unites the Peloponnesus to the mainland, is called the Isthmus of Corinth (see **ISTHMUS**). It is about 10 miles in length, and about four miles in width at its northern extremity, near Mount Geraneion. In ancient times a wall was built across the isthmus to prevent invasion from the north. On the Saronic Gulf, at the point where this wall terminated and where the Isthmian games were celebrated, is situated the modern town of Isthmia. Excavations by the French School in 1883 brought to light remains of the ancient sanctuaries and houses on a fortified hill; near by are scanty ruins of the old Stadium. The isthmus is pierced by a canal, completed in 1893. See **CORINTH CANAL**.

CORINTH CANAL. The construction of a canal across the Isthmus of Corinth was begun

by Nero, but the undertaking proved too vast and was abandoned. In 1881 a French company obtained a concession to construct such a canal and in 1882 work was begun. In 1889 the work was transferred to a Greek company, and was brought to completion by Matsas, a Greek engineer, in 1893. The canal, uniting the Gulf of Corinth with the Saronic Gulf, shortens the journey from the Adriatic to the Piræus by 202 miles. It is 4 miles long, and has a depth of 26 feet, thus admitting the largest vessels. The difficulties of navigation, however, in the Corinthian and Saronic gulfs, have led large steamships to prefer the longer voyage around Cape Malea. At its western extremity a new town, Poseidonia, has sprung up, and at its eastern end is the modern town of Isthmia.

CORINTHIAN ORDER. The latest developed and most elaborate of the three orders of Greek architecture. See **COLUMN**.

CORINTHIANS, EPISTLES TO THE (translation of Gk. *πρὸς Κορινθίους*, sc. *ἐπιστολαί*, *pros Korinthiōus*, to the Corinthians, sc. *epistolai*, epistles). Two writings in the New Testament addressed by Paul to the Church at Corinth, which he had founded in A.D. 50. The former of these letters was written during Paul's stay in Ephesus, from A.D. 52 to 55, probably shortly before Pentecost of 55 (cf. xvi. 8, 9: "But I will tarry at Ephesus until Pentecost; for a great door and effectual is opened unto me, and there are many adversaries"). It was occasioned primarily by reports brought to the Apostle through certain members of the Corinthian Church to the effect that there were grave disorders in the Church, consisting chiefly in party factions, gathering around the names of the Apostles and their workers and Christ (chaps. i.-iv.), and also in grossly immoral practices (chap. v.) and in a contentious spirit which resulted in bringing one another before the courts of law (chap. vi.), all of which things the Apostle sternly rebuked. The further occasion of the Epistle was a letter addressed by the Corinthian Church to the Apostle, apparently in reply to a previous letter sent by him to them, in which he had prohibited their companionship with persons of bad character and life, but evidently in such terms as to lead to the misunderstanding that he had in mind all persons of this character in their community. The practical impossibility of complying with this command they had doubtless laid before the Apostle in their letter, in view of which protest he explains that his intention was to prohibit Christian companionship with such persons in the membership of the Church (v. 9-11: "I wrote unto you in my Epistle to have no company with fornicators; not at all meaning with the fornicators of this world . . . but . . . if any man that is named a brother be a fornicator, or covetous, or an idolater, or a reviler, or a drunkard, or an extortioner, with such an one no, not to eat"). In this same letter the Corinthians apparently laid before the Apostle definite questions regarding certain troubles in their church life, to which the Apostle replies in order (chaps. vii.-xvi.). These questions regarded marriage (chap. vii.), the eating of meat offered in sacrifice to idols (chap. viii.), the proprieties of public worship (chaps. xi.-xiv.)—chiefly as to the use of the charismata or spiritual gifts (chaps. xii.-xiv.),

the doctrine of the resurrection (chap. xv.), and the collection for the saints in Jerusalem (chap. xvi.)—possibly also the return of Apollos to work among them (xvii. 12).

The second of the letters was written after Paul had left Ephesus, while he was on the journey from that city to Corinth, most likely in the spring or early summer of 55, from some of the Christian centres in Macedonia. It was occasioned by the report brought to the Apostle through Titus, to the effect that the personal hostility to the Apostle in the Church had given way to the spirit of general loyalty to his rule (chap. vii.). In this second letter there are passages which make it impossible to avoid the impression that the Apostle made more visits to Corinth than are recorded in the Book of Acts, and that, in addition to the letter of prohibition referred to above, he wrote more letters to the Church than are distinctively preserved in the New Testament. The passages referring to the visit are the following: (ii. 1) "But I determined this for myself, that I would not come again to you with sorrow;" (xii. 21) "Lest again when I come my God should humble me before you;" (xiii. 2, 3) "I have said beforehand . . . as when I was present the second time . . . that, if I come again, I will not spare." From these it is clear that the Apostle had made a visit to Corinth, which was of a sorrowful kind. This cannot possibly be the only previous visit of which we have record in the Acts—the visit in which he founded the Church; since, while at that time he was discouraged regarding his gospel work in Corinth, there had been no sorrow between him and his people, such as these passages necessarily imply. This inference is confirmed by the remaining passages: (xii. 14) "Behold, this is the third time I am ready to come to you;" (xiii. 1) "This is the third time I am coming to you," from which it is clear that the visit which he was about to make was, to the Apostle, his third visit to this place. The passages referring to the letter are the following: (ii. 3, 4) "Out of much affliction and anguish of heart I wrote unto you with many tears;" (vii. 8, 9-12) "For though I made you sorry with my Epistle, I do not regret it. . . . So although I wrote unto you, I wrote not for his cause that did the wrong, nor for his cause that suffered the wrong," etc., from which it is clear that the Apostle has in mind some other letter than that which we know as I. Corinthians; since, while I. Corinthians might be called a letter of censure, whose object was to shame its readers, it could not in any way be termed a letter of 'affliction' and 'anguish of heart' and 'many tears.'

The only reasonable explanation of these intimations is to be found in the theory that, between the writing of the first and second canonical letters, Timothy, whom Paul had sent to Corinth at the time of the first letter, returned to Ephesus with news of an urgent situation in the Church—an outbreak evidently of personal hostility against the Apostle (see ease of discipline referred to in ii. 5-11), in response to which Paul hurries across to Corinth by the direct sea route, but is unable to better the state of affairs (cf. xii. 21, as above, which is confirmed by the estimate placed upon him by his opponents in x. 10: "His letters, they say, are

weighty and strong; but his bodily presence is weak, and his speech is of no account"). Returning to Ephesus, he writes to the Church in the fullness of his mortification and grief a letter bearing upon his experience in this visit and upon the general situation in the Church, a letter which might easily have been one 'of many tears.'

In such a case, however, it is quite certain that we have a portion of this painful letter preserved in the last four chapters of our second Epistle (chaps. x-xiii.). The evidence for this statement lies in the following facts: (1) Between chaps. i-ix. and chaps. x-xiii. there is a marked and otherwise unaccountable difference in the feelings of the Apostle. The earlier chapters are full of cheer and satisfaction; the later of dissatisfaction and distress. (2) Between these two groups of chapters there is, further, a marked and otherwise unintelligible difference in the condition of the Church's affairs. In the earlier chapters the Church is manifestly loyal to the Apostle; in the later it is as manifestly disloyal. (3) Between these two groups of chapters there is a peculiar set of cross-references. It is found in the following passages:

I. (ii. 3) "And I wrote this very thing, lest when I came, I should have sorrow from them of whom I ought to rejoice" (xiii. 10) "For this cause I write these things while absent, that I may not when present deal sharply," etc.

II. (i. 23) "But I call God for a witness upon my soul, that to spare you I forbore to come to Corinth;" (xiii. 2) "I have said beforehand, and I do say beforehand . . . that, if I come again, I will not spare."

III. (ii. 9) "For to this end also did I write, that I might know the proof of you, whether ye are obedient in all things;" (x. 6) "—being in readiness to avenge all disobedience, when your obedience shall be made full."

From these passages it would appear (1) that the actions or states of feeling described in the later chapters as future are in the earlier chapters described as past; (2) that between the future references to these states and actions and the references to them that are past there had come over the situation to which they apply a change for the better. These two phenomena are rendered the more significant by the fact that the passages in the earlier chapters are all of them from a portion of the letter (i. 23-ii. 11) in which reference is made expressly to the painful letter (ii. 3, 4) and most probably to the experiences of the sorrowful visit (ii. 5-11); while two of the three passages in the later chapters are from a portion of the letter (xiii. 1-10) in which reference is made specifically to a contemplated visit which has in it the possibilities of being one of unpleasantness between the Apostle and his people.

These internal evidences are confirmed by the fact that II. Corinthians does not seem to have been known as early in the post-Apostolic Church as I. Corinthians. This is especially evident from the fact that Clement of Rome, in writing to the Corinthian Church (A.D. 95), though there was in the situation of the Church that which would have made references on his part to II. Corinthians most apt and forceful, apparently confines all his references to the less applicable I. Corinthians. There seems to be no allusion to it before Polycarp's letter to the Philippian

Church (A.D. 116); while, generally speaking, references to it by the Fathers are few and not over clear. But if II. Corinthians was thus so much later in coming to the notice of the Church, this period of obscurity would involve necessarily a harsh usage for the first copies of both the letters of which it is composed, and this may easily have resulted in a loss of the closing portion from Paul's last letter (chaps. i.-ix.) and, correspondingly, of the earlier portion of his painful letter (chaps. x.-xiii.). Inasmuch, however, as both these fragments, when finally discovered, gave evidence of having been written by Paul (cf. i. 1, 2, which gives the Apostolic greeting in the name of Paul: "Paul an Apostle," etc., and x. 1, which presents Paul by name as the writer: "Now I, Paul, myself entreat you," etc.), and as one showed itself clearly to be the beginning, while the other as clearly showed itself to be the close of one of his letters, it would be not at all unnatural were the two fragments placed together as one Epistle and so received generally in the Church.

In view, therefore, of the facts presented in the Epistles, we recognize three visits of Paul to Corinth: (a) at the founding of the Church; (b) in response to the urgency call; (c) at the close of his mission work in the East. We recognize also four letters of Paul to the Church: (a) the letter of prohibition; (b) the canonical I. Corinthians; (c) the painful letter (II. Corinthians x.-xiii.); (d) the canonical II. Corinthians (chaps. i.-ix.).

Together with the Epistle to the Galatians and the Epistle to the Romans, the Corinthian Epistles have been almost universally received as genuine letters of Paul. The Tübingen School (1845) made these four Epistles the standard for their criticism against the remaining New Testament writings. Recently a school of Dutch critics (1880-90) has sought to disprove their Apostolic origin. Other Continental critics (1875-90), while admitting their substantial genuineness, have attempted to redistribute their contents among various documents. Still other critics (1880-87) confine their efforts to the elimination of certain minor interpretations. Apart, however, from the two-epistle theory for II. Corinthians, as advanced in this article, the letters are not only unmistakably genuine products of Paul, but are clearly integral in their contents.

BIBLIOGRAPHY. *Commentaries:* A. Klöpffer (Berlin, 1874); T. S. Evans, in the *Speaker's Bible Commentary* (New York, 1881); A. P. Stanley (London, 1882); T. C. Edwards, *I. Corinthians* (London, 1885); F. Godel, *I. Corinthians*, English trans. (Edinburgh, 1886); C. J. Ellicott, *I. Corinthians* (Andover, 1889); P. W. Schmiedel, in *Handkommentar zum Neuen Testament* (Freiburg, 1891); G. Schnedermann, in Strack u. Zöckler, *Kommentar* (Munich, 1894); H. A. W. Meyer, edited by C. F. G. Heinrici (Göttingen, 1896-1900). *Introductions:* A. Hilgenfeld (Halle, 1875); B. Weiss, English trans. (Edinburgh, 1888); H. J. Holtzmann (Freiburg, 1892); G. Salmon (London, 1894); Th. Zahn (Leipzig, 1900); B. W. Bacon, in "New Testament Handbook Series" (New York, 1900); A. Jülicher (Leipzig, 1901); J. Moffatt, *The Historical New Testament* (New York, 1901). *Discussions:* A. Hausrath, *Der Vierkapitelbrief des Paulus an die Corinthier*

(Heidelberg, 1870); F. C. Baur, *Paulus*, English trans. (London, 1873-75); R. J. Knowling, *The Witness of the Epistles to Christ* (London, 1892); F. J. A. Hort, *The Christian Ecclesia* (London, 1898); Röhr, "Paulus und die Gemeinde von Corinth," in *Biblische Studien*, vol. iv. (Freiburg, 1899). J. H. Kennedy, *The Second and Third Epistles of Saint Paul to the Corinthians* (London, 1900). The "Dutch School of Criticism" is represented specially by A. Pier-son and S. A. Naber, in *Verisimilia* (Amsterdam and The Hague, 1886); W. C. Van Manen, in *Paulus* (Leyden, 1890-91); the "Distribution School" specially by C. Clemens, *Die Einheitlichkeit der Paulinischen Briefe* (Göttingen, 1894); H. Liseo, *Die Entstehung des zweiten Korintherbriefes* (Berlin, 1896); the "Interpolation School" specially by C. Holsten, *Das Evangelium des Paulus*, vol. i. (Berlin, 1880); C. M. S. Baljon, *De Tekst der Brieven aan de Romeinen, Corinthiërs en Galatiërs* (Utrecht, 1884).

CORINTHIANS, THIRD EPISTLE TO THE. See APOCRYPHA.

CORINTO, kō-rēn'tō (Sp. Corinth). A seaport in the Department of Chinandega, Nicaragua, situated on the island of Aserradores, between Realejo Bay and the Pacific (Map: Central America, D 4). It has an excellent harbor, and is the chief Nicaraguan port of the west coast, having supplanted Realejo. It is the residence of a United States consular agent. Corinto was founded in 1863. Population, 3000.

CORIOLANUS, CAIUS or GNAEUS MARCIUS, a Roman patrician. According to the half-fabulous legend, he was surnamed Coriolanus on account of his capture, B.C. 493, of the town of Corioli, belonging to the Volsci. Of a proud and haughty spirit, he was strongly opposed to the plebeians, whom he looked upon as the 'enemies' of his order: and on one occasion, during a time of famine, he argued in the Senate against a gratuitous distribution of the corn which had arrived from Sicily, and insisted that the plebeian tribunes, lately instituted, should first be discharged from office. For this he was impeached and banished. He took refuge among the Volscians, whom he aided in their war with the Romans. His victories at the head of his Volscian troops alarmed the Romans, who, on his approach to their city, sent a variety of deputations to plead with him. He was deaf to every entreaty. At last, the noblest matrons of Rome, headed by his old mother and his wife, Volturnia, leading her two children, came to his tent. His burning desire to be revenged on those who had dishonored him was cooled by the tears of his relatives, and he led back the Volsci to their own territories, where he lived to an advanced age.

CORIOLANUS. (1) A tragedy by Shakespeare, produced, probably, in 1609, and published in 1623. The plot is derived from *Plutarch's Lives*, and some speeches are taken verbatim from Sir Thomas North's translation of that work, published in 1579. The leading idea of the play is the rivalry between the patricians and plebeians, which existed in the fifth century B.C.

(2) A tragedy by James Thomson, published, after his death, in 1748 or 1749.

CORIPPUS, FLAVIUS CRESCONIUS. An author, native of Africa. He is supposed to have lived in the sixth century. He was the author

of a panegyric on Justin the Younger, Byzantine Emperor (A.D. 565-578). Corippus was also the author of *Johannis*, a poem celebrating the exploits of a proconsul of that name in Africa in Justinian's time.

CORIS'CO. An island belonging to Spain, situated off the coast of Guinea, Africa, at the entrance to Corisco Bay, in latitude 0° 55' N., longitude 9° 20' E. It has an area of about five and one-half square miles, and is generally low and flat. The island is densely wooded, chiefly with ebony and logwood, which, with the ivory obtained from the mainland, constitute the chief articles of trade. Population, in 1900, 1438.

CORK (OIr. *Corach-Mor-Murham*, Great March of Munster). A maritime county in Munster and the southernmost and largest of the Irish counties (Map: Ireland, C 5). Area, 2890 square miles. Cork is hilly, with a great diversity of surface. The western part is rocky, mountainous, wild, and boggy; the east and south, rich, fertile, and picturesque. The Munster coal-field occupies 400 square miles in the northwest section of the county; some iron is also mined. The dairy industry is extensive, Cork butter being highly esteemed. The capital is Cork. Population, in 1841, 858,100; in 1891, 438,432; in 1901, 404,800.

CORK. A city, civic county, port, and Parliamentary borough, capital of Cork County, Ireland, on the Lee, 11 miles above its discharge into the sea, and 165½ miles southwest of Dublin by rail (Map: Ireland, C 5). It stands in the centre of a picturesque valley, partly on an island, formerly a swamp, which the word Cork, *Corroch*, or *Corcagh* implies, and partly on the north and south slopes of the river banks. Several bridges span the river to the central island. The situation is picturesque from the uneven ground, irregular streets, intersecting river, and overhanging heights. Cork is the seat of a Roman Catholic bishopric. Its finest building is the Anglican Cathedral of Saint Finn Barr, completed in 1879 on the site of the saint's seventh-century foundation. There are four monasteries, two nunneries, and among other buildings of note are the bishop's palace, the free library schools of science and art (with a museum), and Queen's College, affiliated with the Royal University of Ireland and occupying a fine Tudor-Gothic quadrangular building. The Church of Saint Anne Shandon, with its high tower, is near the site of the old Shandon Castle, once a stronghold of importance. There is a public park of 240 acres, with a well-known race-course. There is also a handsome public cemetery. The banks of the Lee, above and below Cork, are studded with villas. The estuary contains several islets rising abruptly from the water, with narrow channels between them. It is a land-locked basin, having an entrance one mile in width, which is defended by batteries on Spike, Haulbowline, and Rocky islands, which are also occupied by a convict prison, Government repairing dock, ordnance depots, and artillery barracks. On the shores of the estuary are the towns of Passage and Queenstown, formerly Cove of Cork. The Lee is navigable for a considerable distance above the city, and on the improvement of the navigation the harbor commissioners have expended large sums. The harbor, formed by the Lee estuary, is noted for its size and safety, and has been

the main source of the rise and progress of the city. It has dry-docks and patent slips. An average of 2500 ships enters and clears the port annually. Its own shipping comprises 60 sailing and 50 steam vessels of 22,000 tons burden. It has a large export and import trade, but of a fluctuating and latterly declining character. Its chief exports are oats, manure, and whisky; imports, wheat, maize, fish, meat, chemical products, sugar, and timber. The chief manufactures of the city are leather, metallic goods, woolen and linen goods, beer and whisky. The United States is represented by a consul. Founded in 622 by Saint Finn Barr, during the ninth century Cork was frequently devastated by the Danes, who in 1020 made it a trading station and built the city walls. Desmond Macartly, King of Munster, surrendered it to Henry II. in 1172. During the Civil War it held out for the King, and was taken by Cromwell in 1649. In 1690 it was again besieged and taken by Marlborough. Population, in 1891, 75,345; Parliamentary borough, 97,300; in 1901, 75,978; Parliamentary borough, 99,690; of whom the great majority are Roman Catholics. Cork returns two members to Parliament. Consult Cusack, *History of the City and County of Cork* (Dublin, 1875).

CORK (Sp. *corcho*, cork, from Lat. *cortex*, bark). The unusually developed epiphloeum (see BARK) of the bark of the cork-tree or cork-oak (*Quercus suber*), the *alcornoque* of the Spaniards, a species of oak (q.v.), a native of southern Europe and northern Africa. Theophrastus, in book ii. of his *Historia Plantarum*, speaks of the cork-tree as a native of the Pyrenees. Spain and Portugal chiefly supply the world with cork, although the imported tree is said to thrive in some parts of the United States. Planted trees are said to be inferior to the natural forests. The cork-tree is not of great size, generally 20 to 40 feet high, with ovate-oblong evergreen leaves, which are sometimes entire and sometimes sharply serrated. It lives to a great age, in some instances 300 or 400 years, and is as much as 15 feet in circumference. It blossoms in April or May; the fruit ripens from September to January, falling on the ground as soon as ripe. The acorns are edible, and in taste resemble chestnuts. The bark in trees or branches from three to five years old acquires a fungous appearance, new layers of cellular tissue being formed, and the outer parts cracking from distension until they are finally thrown off in large flakes, when a new formation of the same kind takes place.

Cork intended for the market is generally stripped off a year or two before it would naturally come away, and the process is repeated at intervals of twelve or fourteen years, according to the vigor of the tree. The cork of the first barking, which is removed usually when the tree is about twenty-five years old, is known as the virgin bark, and is valueless. The removal of the cork does not require the removal of the whole bark, but only of external layers of spongy cellular tissue, all or the greater part of which has ceased to have any true vitality, and has become an incumbrance to the trees. Consequently, instead of being injurious, the taking of the bark, when done with proper care, rather promotes the health of the tree, which continues to yield crops for 150 years. In stripping off the cork

longitudinal and transverse incisions are made to the proper depth, and each piece is then cut away from the tree. The average yield for one tree is about 45 pounds. The slabs are placed in boiling water for one hour, a process which increases their bulk one-fourth and also their elasticity, and dissolves the tannin and other substances. Steam is sometimes employed instead of hot water. The cork is then scraped either by hand or by scraping machines, in which process it loses from 20 to 30 per cent. of its weight. The cork is then cut crosswise into strips of the proper length, then lengthwise, and finally into pieces of the proper shape. In many districts this industry is carried on in the homes by hand, but there are also cork-cutting machines, especially in the United States, of great efficiency. The cork is then washed in oxalic salt, or some other solution, and then dried. It is now ready to be sorted and packed for the market. In Spain the corks are packed in lots of 30,000 in bagging cloth, and called bales.

Besides its use for stopping bottles, casks, etc., cork is largely used, on account of its lightness, for floats of nets, swimming-belts, etc.; and, on account of its impermeability to water, and its being a slow conductor of heat, inner soles of shoes are made of it. All these uses are mentioned by Pliny; but the general employment of corks for glass bottles appears to date only from the fifteenth century. It is also used for bicycle-handles, smokers' mouthpieces, and many other modern devices. The bits that are left in the process of manufacture are ground to powder and used in the manufacture of linoleum and for many other purposes. The Spanish black used by painters is made by burning cork in close vessels.

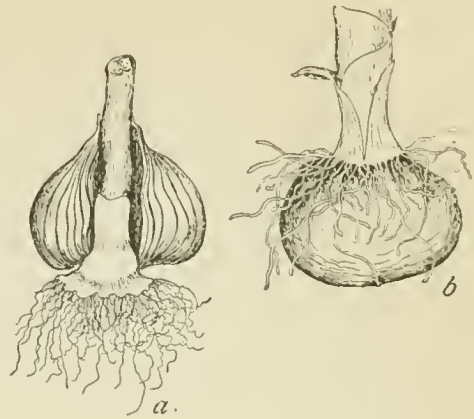
CORK, EARLS OF. See BOYLE.

CORLEONE, kôr'lâ-ô'nâ (It., lion-heart). A city in the Province of Palermo, Sicily, situated 1950 feet above the sea, at the foot of Mount Cardellia, and 21 miles south of Palermo (Map: Italy, H 10). It has a handsome church that was restored in 1840, and the ruins of two castles. The ancient Korlium was founded by the Saracens and colonized with Lombards by Frederick II. in 1237. Population (commune), in 1881, 15,686; in 1901, 14,803.

CORLISS, GEORGE HENRY (1817-88). An American engineer and inventor, born at Easton, N. Y. In 1844 he removed to Providence, R. I., where he engaged in the manufacture of steam-engines, and in 1848 established the Corliss Steam Engine Company. He made and patented many improvements in steam-engines, and in 1876 furnished the 'Corliss engine' to Machinery Hall in the Philadelphia Centennial Exhibition. This engine now furnishes the motive power for the works of the Pullman Car Company, in Pullman, Ill.

CORM (Gk. κορυβς, *kormos*, the trunk of a tree, with boughs lopped off, from κερειν, *keirein*, Lith. *skirti*, OHG. *sceran*, Ger. *scheren*, Icel. *skera*, AS. *sceran*, Engl. *shear*). A compact subterranean stem which is related both to tubers and bulbs. It is very short and fleshy, usually more or less rounded or depressed, and in this feature is related to the tuber. It is related to the bulb, however, by the fact that this short and compact fleshy stem is invested by thin

scale leaves. Corms are sometimes spoken of as 'root bulbs,' and in popular usage are con-



CORMS.

a, Colchicum; b, Arisaema (Indian turnip).

stantly spoken of as 'bulbs.' Common illustrations are found in the Indian turnip, crocus, gladiolus, cyclamen, etc.

CORMENIN, kôr'me-nân'. LOUIS MARIE DE LA HAYE, Vicomte de (1788-1868). A distinguished French jurist and publicist, born in Paris. He was educated for the law, and in 1810 was appointed auditor of the Council of State, in which capacity he drew up several of the Council's most important reports. He was a Deputy from 1828 to 1846. His extensive knowledge of jurisprudence and of the practical affairs of government, and the clear and logical force with which he presented his ideas, soon secured for him great influence in public affairs. His famous *Lettres sur la liste civile* began to appear in 1831, and passed through twenty-five editions within ten years. He was elected to the National Assembly in 1848, and was made president of the commission appointed to remodel the Constitution, in which capacity he strongly advocated universal suffrage. Although he had opposed the admission of Louis Napoleon to the National Assembly, and afterwards had protested against the coup d'état, he was appointed, in 1852, a member of the reconstituted Council of State. In 1855 he was elected a member of the Institute. Besides his numerous political pamphlets, published under the pseudonym of 'Timon' and subsequently collected as *Pamphlets de Timon* (1848), Cormenin wrote *Etudes sur les orateurs parlementaires*, a work which has passed through nearly twenty editions, and a valuable *Droit administratif*, dealing with the law of France.

CORMON, kôr'môn'. FERNAND (1845—). A French painter. He was born in Paris, and studied under Fromentin, Cabanel, and Portaels. He received the Prix du Salon in 1875, a medal of honor at the Salon in 1887, the Grand Prix at the Exposition of 1889, and in the same year became an officer of the Legion of Honor, of which he had been chevalier since 1880. In his archaeological paintings, of which "The Stone Age," exhibited in 1884, is a good specimen, he shows great accuracy in reproducing the char-

acteristics of the time, having given much study to the scientific accounts of ancient and prehistoric periods. He enjoys high reputation as an instructor, and has been successful also in painting portraits. Other works worthy of special mention are: "The Death of Ravana" (1875); "Cain" (1880); and "The Victors of Salamis" (1887).

CORMONT, kôr'môn', THOMAS and REYNAUD de. Father and son; French architects of the thirteenth century; prominent among the builders of the Cathedral of Amiens, following Robert de Luzarches (1223-69).

CORMONTAIGNE, kôr'môn'tü'ny', LOUIS DE (1695-1752). A French military engineer, who took part in some of the most important sieges in the War of the Polish Succession and that of the Austrian Succession. He had charge of the line of fortification from Calais to the Rhone, and he built new defenses at Strassburg, Metz, and Thionville. His improvements of Vauban's system of fortification are embodied in his *Architecture militaire, par un officier de distinction* (1741).

COR/MORAN. A Cornish giant in the story of *Jack the Giant-Killer*, whom Jack killed by causing him to fall into a covered pit.

CORMORANT (Fr. *cormoran*, It. *corro marino*, from *corro*, crow, and *marino*, marine; cf. Bret. *morrnan*, cormorant, from *mor*, Lat. *mare*, sea + *bran*, crow). A group of web-footed birds comprising the steganopode family Phalacrocoracidae, characterized especially by a bare dilatible membrane beneath the lower mandible, but not in the form of a sac under the throat as in the pelicans; a compressed bill, rounded above, and with a strong hook at the point of the upper mandible; the nostrils linear, and seemingly impervious to air; the claw of the middle toe serrated, used in trimming the plumage; the wings of moderate length; the tail rounded, the feathers stiff and rigid, and used to aid in walking or climbing. The species are distributed over the coasts of most parts of the world, some of them ascending rivers and even visiting freshwater lakes in pursuit of fish, on which all of these birds subsist exclusively.

Cormorants are proverbially voracious. They do not take their prey by diving, when on the wing, but pursue it by swimming and diving, using their wings in progress under water, and sometimes descending to a great depth; a British species has been caught in a crab-pot fastened 120 feet under water. When the prey has been taken in a manner inconvenient for swallowing, they toss it in the air and adroitly catch it as it descends. The behavior of cormorants in fishing and toward each other in their colonies has been described at length by E. Selous in *Bird Watching* (London, 1901). Some of the species frequent high rocks, others low islands, on which they make rude nests, chiefly of seaweed and almost always in colonies; some perch and even build their nests on mangroves and other seaside trees. Their greenish-blue eggs are covered with a calcareous incrustation. The flesh of all the species is dark and of a fishy taste, but is sometimes used as food, particularly that of young birds.

There are described about twenty-five well-defined species, of which seven are found in North America. The commonest is the double-

crested cormorant (*Phalacrocorax dilophus*), so called from the lateral crest of curly feathers on the sides of the head, and present throughout North America. The 'common' cormorant (*Phalacrocorax carbo*) occurs abundantly on both sides of the Atlantic, especially northward, while on the Pacific Coast three species are numerous—the tufted cormorant (*Phalacrocorax penicillatus*), the red-faced cormorant (*Phalacrocorax bicristatus*), and the violet-green cormorant (*Phalacrocorax violaceus*); the two latter are especially characteristic of Alaska. The British species are the 'common' cormorant, which is about 33 inches long and almost of a black color, but during the breeding season exhibits a sprinkling of elongated white and almost bristly feathers on the head and back of the neck; and the green cormorant, or 'slag' (*Phalacrocorax graculus*), which is smaller and dark-green. Two notable species are Pallas's cormorant, now extinct (see EXTINCT ANIMALS), and Harris's, the surf-fishing, flightless species of the Galapagos Islands, which is exceedingly rare, of great size, and has wings useful only as fins. See FLIGHTLESS BIRDS.

Fishing with cormorants is a very ancient practice, still regularly followed among the Chinese and Japanese, and lately revived as a sport in Great Britain. The birds are taken from the nest when young, and are easily tamed and trained; or old cormorants may be trapped and taught to serve. They are kept for a while and fed meat, etc., until accustomed to their master and the feeding methods. Then a line is fastened to one leg by a leather anklet, and they are taken out in a boat to fish and drawn in after each capture. After a time they may be set free. A ring or strap-collar is fastened about their necks, so that no fish can be swallowed, but only pouched, and they return to the boat to be relieved of their burden. After a suitable time the ring is removed, and they are allowed to fish for themselves, or fed. These birds make a living for many families on the Chinese coast, and well-trained ones are highly valued. The modern use of cormorants in this way in England was described and illustrated in *The Field* (London, October, 1890). See Plate of FISHING BIRDS, and Colored Plate with WATER BIRDS.

CORN (Lat. *cornu*, horn; connected with Ir., Welsh *corn*, Gall. *kápron*, *karnon*, Goth. *haurn*, AS., Engl. OIG. *horn*, Ger. *Horn*, also with Gk. *képas*, *keras*, Skt. *srīṅga*, horn). A small hard growth resulting from an increase in the thickness of the cuticle or epidermis, which is generally caused by the irritation of some excessive pressure or friction on the part. Corns occur most commonly on the toes, as a result of tight shoes. Three varieties of corns are described—viz. (1) Laminated corns, or callosities, in which the hardened cuticle is arranged in layers, frequently of a dark-brown color, from the effusion of blood in the deeper layers. (2) Fibrous corns (clavi), which are not only fibrous in their early stages, but have convex surfaces, and, as time goes on, sink into the skin, sometimes producing great pain. Frequently a bursa, or small bag containing serum, is formed beneath, and if this should inflame, pus speedily forms, and the pain and constitutional irritation become severe; at other times the pressure may cause absorption of the ends of bones, and serious alterations in the condition of a joint. (3) Soft corns occur between the toes and cause much annoyance; they

are generally small, and as they are constantly bathed in perspiration, the cuticle does not harden, as in the other varieties. They sometimes give rise to painful ulcerations, and should never be neglected. The treatment of corns consists in the removal of all undue pressure or friction, either by removing the shoe altogether, or protecting the corn by surrounding it with a ring of felt or 'corn plaster'; or the hardened cuticle may be softened by the application of water of ammonia and then scraped or filed away; or it may be extracted by using a dull instrument. A soft corn should be treated by putting small rings of absorbent cotton around it and between the toes, and keeping it dry till it becomes a hard corn, and then treating it as such. Most druggists keep a 'corn cure' composed of salicylic acid dissolved in collodion, several applications of which will remove a hard corn. In all serious cases, application should be made to a chiropodist.

Corns affect horses as well as man. In the foot of the horse they occur in the angle between the bars and outer crust, and are caused by a bruise of the sensitive secreting sole. Two forms of feet are especially subject to them—those with deep, narrow, slanting heels, in which the sensitive sole becomes squeezed between the doubled-up crust and the shoe; and wide, flat feet, which, by the senseless cutting away of the bars and outer crust, allow the delicate interior parts to be pressed with all the force of the animal's weight on the unyielding iron shoe. Serum and blood are poured out, while the secreting parts, being weak and irritable, produce a soft, scaly, unhealthy horn. Corns constitute unsoundness; cause a short, careful, tripping gait; are a very frequent source of lameness among roadsters; abound in badly shod horses, especially those with the kind of feet alluded to, and usually occur in the inside heels of the fore feet, these being more especially subjected to weight, and hence to pressure. The discolored spot indicating the recent corn must be carefully cut into with a fine drawing-knife, any serum or blood being thus allowed free vent. If the bruise has been extensive, a poultice will have the twofold effect of allaying irritation and relieving the sensitive parts by softening the hard, unyielding horn. When the injury has been of long standing, and soft faulty horn is secreted, a drop of diluted nitric acid may be applied. On no account must the bars or outer crust be removed: they are required for bearing weight, which may be further kept off the injured part by the use of a bar-shoe. In horses subject to corns, the feet should be kept soft by dressing with tar and oil, or any suitable emollient; the corn should be pared out every fortnight: a shoe with a wide web on the inside quarter should be used, and should be nailed only on the outside: and, if the sole is thin and weak, leather pads should be employed. In bad cases the shoes may be removed and the horses turned out to pasture for a few weeks with good results.

CORN, INDIAN. See MAIZE.

CORNARO, kōr-nā'rō, CATERINA (1454-1510). Queen of Cyprus. She was born in Venice, of a patrician family. She was married to James II., of Lusignan, King of Cyprus, in 1472, and succeeded him on his death, only eight months later. When her son had also died, in

1475, the Republic of Venice assumed the government, and in 1489, fearing the conclusion of a marriage between her and Alfonso, the hereditary Prince of Naples, forced her to abdicate and leave the island. She was received in Venice with great pomp, and thereafter resided at Castle Asolo, near Bassano. Caterina has been the favorite subject of romances and the heroine of several operas. Of her life in Venice her cousin, Pietro Bembo, has left a vivid description in *Gli Asolani*.

CORNARO, LODOVICO (1467-1566). A Venetian nobleman and hygienist. Up to his fortieth year he so wasted his forces, originally but feeble, in dissipations of every kind that his life was despaired of. He thereupon adopted strict rules of frugality in eating and drinking, with general care of his health and gentle exercises, and in consequence lived for almost a century. To promote those habits which had proved so advantageous in his own case, he wrote, in his eighty-third year, his celebrated treatise, *Discorsi della vita sobria* ("Essay on Temperate Living"), which was first published at Padua in 1558, and has been translated into many European languages. The best English translation is one bearing date 1779.

CORNBURY, EDWARD HYDE, Lord, third Earl of Clarendon (1661-1723). An English politician, Governor of the colonies of New York and New Jersey from 1702 to 1708. He was a member of Parliament for Wiltshire from 1685 to 1695, and for Christchurch from 1695 to 1701, and in September, 1701, was appointed Governor of the Province of New York by King William, to whose side he had treacherously deserted in 1688, from that of his uncle, James II. He reached New York in May, 1702, was confirmed in his office by his cousin, Queen Anne, on the death of King William, and later in the year was also appointed first royal Governor of New Jersey. In both New York and New Jersey his arbitrary policy, his religious intolerance, his administrative incapacity, and his dissolute habits soon made him extremely unpopular, while in New York the dislike of the people was considerably intensified by his fraudulent appropriation of public funds and his attempts to override the Legislature, which insisted on its right to appoint a treasurer of its own for the "receipt and disbursement of any moneys the Legislature might order to be raised for public purposes," and contended that "the Assembly as representatives of the people of this province are entitled to the same privileges and have a right to the same powers and authorities as the House of Commons enjoy." Finally, as a result of lists of grievances passed by the legislatures of both colonies, Cornbury was removed from office in 1708, and was immediately thrown into prison in New York by his creditors; but, on his becoming third Earl of Clarendon by the death of his father in 1709, he was enabled to pay off his debts and returned to England. He became a Privy Councillor in 1711 and was envoy extraordinary to Holland in 1714. During his term as Governor of New York and New Jersey, he was fond of appearing in public dressed as a woman, and Lewis Morris, a contemporary, wrote: "He dresses publicly in women's clothes every day and puts a stop to all public business while he is pleasing himself with that peculiar but de-

testable maggot." William Smith, in his *History of the Late Province of New York* (New York, 1829-30), speaks of him as follows: "We never had a governor so universally detested, nor one who so richly deserves the public abhorrence. In spite of his noble descent, his behavior was trifling, mean, and extravagant. The indignation of the people was kindled by his despotic rule, savage bigotry, insatiable avarice, and injustice not only to the public, but even his private creditors." Consult: Wilson, *Memorial History of the City of New York*, vol. ii. (New York, 1891-93); and Gordon, *A History of New Jersey* (Trenton, 1834).

CORN-COCKLE. See **COCKLE**.

CORN-CRACKER STATE. Kentucky. See **STATES, POPULAR NAMES OF**.

CORN-CRAKE. See **CRAKE**.

CORNEA, kôr'nè-à (Neo-Lat., fem. of Lat. *cornus*, horny, from *cornu*, horn; so called from its resemblance to horn). The transparent anterior portion of the outer coat of the eye. It contains no blood-vessels and obtains its nutrition by means of a system of spaces filled with lymph. Like other portions of the eye, the cornea is subject to inflammation, known as *keratitis*. Ulcer of the cornea is very common, resulting most often from injury, inflammations of the conjunctiva, phlyctenular keratitis, various disturbances in nutrition, etc. A number of forms are seen attacking different portions of the cornea. Aside from inflammation of other portions of the eye accompanying the ulceration, there may result adhesion and prolapse of the iris, closure of the pupil, and opacity of a portion or the whole cornea. *Staphylococci* (q.v.), a protrusion of a part or the whole of the cornea, may follow. *Keratoconus* frequently occurs in young women; the cornea protrudes at the centre from weakness and intraocular pressure. See **EYE**; and **EYE, DISEASES OF THE**.

CORNEILLE, kôr'nâ'y', PIERRE (1606-84). One of the greatest tragic poets of France. He was born at Rouen, June 6, 1606, the son of a lawyer and magistrate of worth, ennobled in 1637. He was trained by the Jesuits, took the advocate's oaths in 1624, and held minor legal offices until 1650. His first play, *Mélite*, presented in Paris (1629), was popular, and was followed by *Clitandre* (1632); *La veuve* (1633), his first comedy; *La galerie du palais* and *La suivante*, both comedies (1634). In 1634 he met Richelieu, composed a Latin elegy on his visit to Rouen, and was enrolled among the five poets of the cardinal statesman, of whom Rotrou alone was at all worthy of his company. He soon incurred Richelieu's displeasure for too frank criticism of his literary work, and wrote, uninfluenced by the Minister's favor, *La place royale*, *Médée* (both 1635), and *L'illusion comique* (1636). But all this earlier work was completely cast in the shade by the triumph of his epoch-making *Cid* (1636), though we may not leave these earlier dramas without recording that they are far superior to anything that had preceded them in vigor and in truth to nature, and that to them we owe the happy invention of the *soubrette*. Such promise as they gave, however, pointed less to the field of Corneille's great achievement than to the drama of intrigue and to the comedy of contemporary society, for some of them are full of rather coarse

stage business and a battledore and shuttlecock repartee, and are written in a style that he felt needed apology for its familiar simplicity.

The tragi-comedy of *Le Cid* was so different from Corneille's earlier dramas that it hardly seems the work of the same hand. It gave him a preëminence over contemporaries and predecessors, questioned only by interested rivals and the Academy, which Richelieu summoned to support them, and which it did with stunted half-heartedness. Among the conservative critics passion ran as high as in the famous battle over Hugo's *Hernani*. Scudéry, a critic of repute, asserted, and seems to have believed, that *Le Cid's* subject was ill-chosen, its structure unpardonable, its action clumsy, its versification bad, and that its undeniably beauties were stolen from a Spanish play by Guillen de Castro, which was indeed its acknowledged source. But the public spoke with no uncertain voice, and though *Le Cid* may lack the ethical depth and tragic force of some of Corneille's later dramas, it was and has remained the most popular on the stage of them all. Modern French drama dates from *Le Cid*.

In the controversy that raged around *Le Cid*, Corneille's position was delicate. He was not by nature a tactful disputant, being indeed inclined to arrogance, as he showed on this occasion by his *Excuse à Ariste*; he could not afford to lose the favor that Richelieu continued to show him, and he could not secure a full hearing without imperiling it. He therefore withdrew for three years to Rouen. When he returned in 1639 to Paris it was with a matured genius that almost immediately asserted itself in unparalleled splendor and fecundity. Yet the theme of *Le Cid*, the struggle between honor and love in the hero, between duty and love in the heroine, remains typical of the later tragedies. Typical of them all are also the five acts and the three 'unities': the time limited to twenty-four hours, the scene to a single town, and the action to a central interest—self-imposed fetters worn with even greater complacency by Racine. The Spaniards knew nothing of these unities, and the effort to force their romantic drama into this rigid mold had by the improbabilities, material and psychic, that it involved, given occasion for most of the criticism that had befallen *Le Cid*. Corneille, therefore, in 1639, turned to classical subjects that would lend themselves more readily to the episodic treatment which the unities demanded. What survived of romance in him was the invariable intermingling of love with sterner themes.

Horace (1640) sets the love of man and woman against the love of race and fatherland in four-fold treatment of a single theme. In *Cinna* passion twists love of fatherland to its purpose, and is opposed at once to the magnanimity and the patriotism of Augustus. *Polycuete* (1642) opposes Christian to marital duty in a story of Christian martyrdom, which was a bold venture, for many thought with Boileau that the mysteries of the faith should be kept out of literature. These three, with *Le Cid*, mark the height of Corneille's achievement, save that he touches for a moment a greater intensity of terror in *Rodogune* (1645). The other tragedies are more or less pale imitations of the merits of these. Among them it is worth while to name *La mort de Pompée* (1643); *Théodore* (1646), an even

more dubious venture in Christian martyrology than *Polycette* had been; *Héraclius* (1647), followed by Corneille's election to the Academy; *Nicomède* (1651); *Pertharite* (1652). The last was an unmistakable failure which led Corneille for a time to withdraw altogether from the stage. During these years he had written also two comedies on Spanish models, *Le menteur* and *Suite du menteur* (1644-45), and a good tragi-comedy, *Don Sanche d'Aragon* (1650), which, as the name implies, was Spanish also.

For seven years, from 1852 to 1859, Corneille lived at Rouen and turned his talent to versifying Thomas à Kempis's *Imitation of Christ* (1656), and to the writing of very frank critical essays on his own plays and the drama in general. He was recalled from this by a visit of Molière's company to Rouen in 1658, and between 1659 and 1674 wrote eleven tragedies of unequal mediocrity, though in each of them there were verses "with necks in thunder clothed and long resounding pace," such as he alone has known the art to create. The time to regret had passed, the time to cry halt had come when Boileau wrote his famous epigram, *Après Agésilus hélas* (1666); *Mais après Attila hélas* (1667). A new conception of dramatic art had been introduced by Boileau and Racine, and when Corneille was beguiled into a contest for Court favor he was fated to see his young rival's *Bérénice* preferred to his *Tite et Bérénice* (1670). Other plays of this period are: *Œdipe* (1659); *La toison d'or* (1660); *Scrtorius* (1662); *Sophonisbe* (1663), after which he received an irregularly paid pension of 2000 livres; *Othon* (1664); *Psyché* (1671), in collaboration with Molière and Quinault; *Pulchérie* (1672); and *Suréna* (1674). He had written some devotional poetry between 1665 and 1670, and among his last compositions were some beautiful verses of thanks addressed to King Louis XIV. in 1676. Corneille's last years were passed in pecuniary straits, "satiated with glory and hungry for money," as he said, and when, at the urgent request of Boileau, the King sent him 200 pistoles, it was already too late. He had no time to spend them, and two days after he was dead (October 1, 1684).

Corneille's works show him as his friends describe and as his portraits paint him, a man of serious, rugged, and almost stern temper. Whether from pride or shyness, he never courted favor, nor took his place with courtiers at a time when this was almost necessary to literary prosperity. His public manners were not gracious, though he was an affectionate husband and brother. His best work never lost popular favor, and the most eminent of his literary contemporaries always did him justice. The greatest of them, Molière, spoke of him as his master, and Racine pronounced at the Academy a eulogy on his rival at once just and generous, that later critics have in the main confirmed.

The first impression made by an attentive reading of Corneille's work is its remarkable unevenness. Judged by his best he ranks with the greatest. No dramatic poet rises to grander heights, but many a lesser talent may attain a higher average. Hence no poet is more quotable and few more quoted, for he has hundreds of lines that cling to the memory by their crash of sound and startling fullness of sug-

gestion, "the most beautiful," says the French critic Faguet, "that ever fell from a French pen." And the same critic says of Corneille's language that it is "the most masculine, energetic, at once sober and full, that was ever spoken in France."

Corneille's tragedies arouse admiration rather than tragic fear. His interest is not in the fate of his characters, but in the unconquerable mind with which they meet it, their haughty disdain of destiny. He is of the school of the emphatics, delighting in extraordinary situations and subjects, in whatever will challenge the will to its utmost utterance. There is no fine-spun sentiment even in the love of *Le Cid*. But tragedy with the limitations of the 'unities' involves much talk and little action, and Corneille's disdain of the endless subject of talk allows the interest to flag for scenes and even acts. There is monotony even in his nobility, and that in spite of the lyric and epic elements which he found in the drama and from which Racine was to free it. Yet his declamations, the tirades of Camilla, Augustus, Cornelia, and many another, are supreme in their kind and will thrill audiences everywhere as long as the antinomies of love and patriotism, honor and duty, perplex men's souls.

The best edition of Corneille is Marty-Laveaux's (12 vols., 1862-68). For early bibliography, see Picot's *Bibliographie Corneilienne* (1865). The best translated biography is Guizot's *Corneille and His Times* (1857); the best modern study, Faguet's "Corneille" (Paris, 1886), in the series *Classiques Populaires. Le Cid, Horace, and Polycette* have been done into English blank verse by Nokes, and (with *Cinna*) into English prose by Mongan and McRae (1878-86). Consult: Sainte-Beuve, *Nouveaux lundis*, vol. vii. (Paris, 1863-72); Levallois, *Corneille inconnu* (Paris, 1876); Guizot, *Corneille et son temps* (7th ed., Paris, 1880); Lemaitre, *Corneille et la poétique d'Aristote* (Paris, 1888); Bouquet, *Points obscurs et nouveaux de la vie de Corneille* (Paris, 1888); Liéby, *Corneille* (Paris, 1892); Brunetière, *Epoques du théâtre français* (Paris, 1892).

CORNEILLE, THOMAS (1625-1709). A French dramatist and miscellaneous writer, whose productions are obscured by the genius of his brother Pierre. He was born at Rouen, August 20, 1625. His forty plays are for the most part of a facile mediocrity, but he has to his credit the longest run of the century for his *Timocrate* (1656), the largest price for his *Sorcière*, and one of the most sensational failures in his *Baron des Foudrières*. He was given his brother's chair in the Academy on the latter's death (1684), and published a dictionary supplementary to the Academy's, and a complete translation of Ovid's *Metamorphoses*, as well as a *Dictionnaire universel géographique et historique* (1708). He was blind from 1704, but his literary activity continued uninterrupted until his death at Les Andelys, December 8, 1709. *Ariane* (1672) and *Le comte d'Essex* (1678) are among his plays the best worthy of memory. His dramatic Works are edited by Thierry (Paris, 1881). Consult Reynier, *Thomas Corneille, sa vie et son théâtre* (Paris, 1893).

CORNEL (OF. *cornille*, from Lat. *cornolium*, cornel-tree, Lat. *cornus*, a cornel cherry-tree,

from *cornu*, horn, so called on account of the hardness of the wood). A term applied in America to various plants of the genus *Cornus*. In Europe the name seems to be restricted to *Cornus mas*, known as cornel or cornelian cherry. It is a common shrub, and was formerly much cultivated as a fruit-tree. It has oval leaves, small heads of yellow flowers appearing before the leaves in spring. The fruit is oblong in shape, a little larger than the sloe, shining red, rarely yellow or white, and when perfectly ripe has an agreeable vinous acid taste. It is either eaten as it comes from the tree, or is made into a preserve. When gathered green it is pickled like olives. In America none of the plants to which the name is applied bears an edible fruit of value. *Cornus canadensis*, dwarf cornel, or bunchberry, is not properly edible, and, so far as known has been little used by man. See DOGWOOD.

CORNE'LIA. A celebrated Roman matron. She was the younger daughter of Scipio Africanus the Elder, the conqueror of Carthage, and mother of the great tribunes Tiberius and Gaius Gracchus, and of Cornelia, the wife of Scipio Africanus the Younger. On the death of her husband, refusing numerous offers of marriage, including even one from King Ptolemy, she devoted herself to the education of her children, a task for which her lofty spirit and wide attainments rendered her admirably fitted, and which had extraordinary results. The only attack ever made upon her lofty reputation was the charge that she was concerned in the death of her son-in-law, Scipio, which was, there is no reason to doubt, a base slander. On her death a statue was erected to her memory bearing the inscription, "Cornelia. Mother of the Gracchi." The base, with the inscription, is now in the Capitoline Museum, Rome. To a Campanian lady who asked to see her jewels, she is said to have presented her sons as the only jewels of which she could boast. After the murder of Gaius, the second of her sons, she retired to Misenum, where she devoted herself to Greek and Latin literature, and to the society of men of letters.

CORNELIA GENS. A distinguished patrician and plebeian clan of Rome. The names of its patrician families, from which came more prominent men than from any other Roman gens, are Arvina, Blasio, Cethegus, Cinna, Cossus, Dolabella, Lentulus, Maluginensis, Mammula, Merenda, Merula, Rufinus, Scapula, Scipio, Sisserna, and Sulla.

CORNE'LIAN CHERRY. See CORNEL.

CORNELISZ, kôr-nā'lis, or **CORNELISSEN.** A family of Flemish painters. The best-known is Cornelis, called Cornelis van Haarlem (1562-1638), an historical and portrait painter. He studied in Haarlem and Antwerp, but finally returned to Haarlem and worked there until his death. He received many civil honors and painted the portraits of the members of the Society of Archers, which are much admired. There are pictures by him throughout Holland and in the art galleries of other European countries.

CORNE'LIUS. (1) A courtier in Shakespeare's *Hamlet*. (2) A physician in Shakespeare's *Cymbeline*, who furnishes soporifics

instead of poisons to the Queen. (3) In Marlowe's *Doctor Faustus*, the friend of Faustus.

CORNELIUS. Bishop of Rome 251-252. His lenient course respecting the lapsed (q.v.), those who in fear of death had renounced Christianity, led to the opposition of Novatian and to the Novatian schism. When persecution was renewed in Rome by Gallus, he fled to Civitavecchia, and there met a martyr's death, September 14, 252. His correspondence with Saint Cyprian on the question of the lapsed is of great historic interest and value, especially on the question of the position of the Roman see. Consult Hartel's edition of the *Letters of Cyprian*, vol. ii. (Vienna, 1871).

CORNELIUS, kôr-nā'lé-ōōs, KARL SEBASTIAN (1819-96). A German physicist, born at Ronshausen in Lower Hesse. He studied the exact sciences at Göttingen and at Marburg, and from 1851 to the time of his death taught physics and physiography at Halle. His published works include: *Die Lehre von der Electricität und dem Magnetismus* (1855); *Theorie des Sehens und räumlichen Vorstellens vom physikalischen, physiologischen und psychologischen Standpunkte aus betrachtet* (1861, followed by another work on the same subject in 1864); *Meteorologie* (1863); *Ueber die Bedeutung des Kausalprinzips in der Naturwissenschaft* (1867); *Ueber die Entstehung der Welt* (1870); *Ueber die Wechselwirkung zwischen Leib und Seele* (2d ed., 1875, followed by another work on the same subject in 1880); *Grundriss der physikalischen Geographie* (6th ed., 1886); and *Abhandlungen zur Naturwissenschaft und Psychologie* (1887).

CORNELIUS. PETER (1824-74). A German composer, nephew of the painter Peter von Cornelius, born at Mayence. He studied for the stage, but not meeting with success as an actor, he turned his attention to music. He became intimate with Liszt, who, in 1858, produced his opera, *Der Barbier von Bagdad*, in Weimar, where, however, it failed. Cornelius was a cultivated man and possessed literary tastes, and as a result of his friendship with Liszt and later with Wagner, he became one of the literary champions of the new, more specifically the Wagnerian, movement in music. In 1886 his *Barbier von Bagdad* was revived in Dresden and other German cities. It was given in the United States under Anton Seidl's direction. Cornelius also composed the operas *Der Cid*, *Guntöd*, unfinished, and songs and choruses.

CORNELIUS, PETER VON (1783-1867). A German historical painter, the founder of the Munich School. He was born September 23, 1783, in Düsseldorf, where his father was inspector of the gallery. At the age of sixteen the youth assisted in supporting the family by his art, and at the same time studied drawing in the Düsseldorf Academy under Langer. His earliest works are unimportant, but after his removal to Frankfort-on-the-Main in 1809, he acquired some celebrity. His first work of importance was his twelve drawings for Goethe's *Faust*, now in the Städel Institute of Frankfort. In 1811 he went to Rome, devoting himself to the study of the art of the Cinquecento, especially to that of Raphael and Michelangelo. He was associated with the so-called Nazarene painters, among whom he found a life-long friend in

Overbeck, but he was too independent to follow their footsteps. During this period he executed his famous drawings for the Nibelungenlied. Together with Overbeck, Veit, and Schadow, he received a commission to decorate a room in the house of the Prussian Consul at Rome, with scenes from the "History of Joseph." In executing this task he revived fresco painting, which had been almost forgotten since the days of Raphael Mengs. His work and that of his associates excited the greatest admiration, and they were engaged to decorate a room in the Villa Massimi, opposite the Lateran, with frescoes from the works of Dante, Ariosto, and Tasso. He had scarcely begun his work when there came a double call to return to Germany. The Prussian Government invited him to become head of the Düsseldorf Academy, and Crown Prince Louis of Bavaria chose him to decorate the new Glyptothek in Munich.

Cornelius arranged to pass his winters in Düsseldorf, where a great crowd of students soon gathered about him, and his summers in executing the frescoes in Munich. He returned to Germany in 1819, and in 1820 he began his work upon the frescoes, which were carried out by his pupils, painting after his design. In two great halls of the Glyptothek he represented the myths of the Greek gods and heroes in works which are masterpieces of drawing and composition. In 1825 he became Director of the Academy of Munich, and was raised to the nobility by King Louis I. of Bavaria. He finished the frescoes of the Glyptothek, representing in the third hall scenes from the *Iliad*. All of this work, however, was executed by his pupils, and may best be studied in the original cartoons by Cornelius, which are now preserved in the National Gallery of Berlin. In 1830 he began the decoration of the Ludwigskirche in Munich, with frescoes representing the "General Confession of Faith of the Christian Church." Contrary to his usual custom, he himself painted upon the large altar wall (62 × 38 feet) a fresco of the "Last Judgment." During the same time he made sketches representing the "History of Christian Art" for the twenty-five loggias of the old Pinakothek, which were painted by Zimmermann.

After a disagreement with the King of Bavaria he was called to Berlin by Frederick William IV. in 1841, and given a commission to decorate the proposed Campo Santo, a burial-place for the royal family of Prussia. The four cartoons executed for this purpose, now in the National Gallery in Berlin, surpass all his previous work. This is especially true of the one containing the "Four Apocalyptic Riders," which is a masterpiece of conception, dramatic life, and boldness of drawing. On the other hand, the "Beatitudes" show appreciation for the beautiful and compact in outline. Until nearly the time of his death, Cornelius was occupied with cartoons. He resided mostly in Rome, but returned to Berlin in 1861, remaining there until his death, which occurred March 6, 1867. During this last period he executed his design for a silver shield, which was a christening present of the King of Prussia to the Prince of Wales, his godson, representing the "Expansion of the Church." He also painted his dramatic picture "Hagen Casting the Nibelungen Treasure into the Rhine," now in the National Gallery, Berlin.

More than any other man, Cornelius may be considered the founder of modern German art. His traditions are still influential in Germany, and are followed by the Munich School of mural painters. His contemporaries held him in high repute, echoing the opinion of Crown Prince Louis: "There has been no painter like Cornelius since the Cinquecento." Modern critics, on the other hand, are not equally favorable, some of them, as Muther, going to the opposite extreme of considering his activity harmful. It is true that he imitated Michelangelo, and that imitation can never produce the healthiest and greatest art; that Cornelius's work is of an intellectual character requiring study for appreciation; that his colors are poor, and that he is sometimes deficient in technique. But, on the other hand, his works were certainly great in composition and in conception. His tendency, like Michelangelo's, was heroic, indeed Titanic, but he was not insensible to grace, and was even capable of expressing the tenderest emotion. He was more of a designer than painter, and his work must be judged by his cartoons. And certainly no painter exercised greater influence upon German art and imagination than did Cornelius in his great cycles of frescoes in Munich and in his cartoons in Berlin. Among his pupils were Wilhelm Kaulbach (q.v.), Carl Hermann, Eberle, and many others. All of them were devoted to the earnest but affable man, who, whatever his deficiencies, had only the highest and noblest aims in art.

Consult: Muther, *History of Modern Painting*, vol. i. (London, 1895); Förster, *Peter von Cornelius: ein Gedenkbuch* (Berlin, 1874); Riegel, *Cornelius, der Meister der deutschen Malerei* (Hanover, 1870); Von Wolzogen, *Peter von Cornelius* (Berlin, 1867); Grimm, H., *Neun Essais* (Berlin, 1865).

CORNELIUS À LAPIDE (1568-1637). A Roman Catholic commentator, whose name was Van den Steen, though he is always known by its Latinized form. He was born at Bocholt, near Liège. He became a Jesuit, and lectured on the Scriptures in Louvain and in Rome, where he died. His fame rests upon his commentary on all the Bible except Job and the Psalms, the first complete edition of which was published in ten volumes folio (Antwerp, 1681). The best edition appeared in Lyons (1838), in eleven volumes, and an English translation of parts of it has been published (3 vols., London, 1876-87).

CORNELL, ALONZO B. (1832-1904). An American politician, son of Ezra Cornell (q.v.). He was born at Ithaca, N. Y., became a telegraph operator, and from 1855 to 1859 was manager of the Central Telegraph Office in New York City. Afterwards he was first vice-president of the Western Union Telegraph Company. In 1868 he was the Republican candidate for Lieutenant-Governor of New York, and from 1869 to 1873 was surveyor of customs in New York. He was chairman of the Republican State Committee from 1870 to 1878, and was three times Speaker of the New York Assembly. From 1880 to 1883 he was Governor of New York, after which he became connected with large financial interests.

CORNELL, EZRA (1807-74). An American capitalist and philanthropist, the founder of Cornell University. He was born in Westchester

County, N. Y., of Quaker parentage; removed with his father, a potter by trade, to De Ruyter, N. Y., in 1819; received a scant education, and for some time taught a district school, besides assisting his father in farming and the making of pottery. He also learned the carpenter's trade, spent a year as a mechanic at Homer, N. Y., and in 1826 removed to Ithaca, where for eight years he managed a flour-mill. In 1839 he joined his brother in the lumbering and farming business, but his attention being turned accidentally in 1842 to the project of constructing a telegraph line from Baltimore to Washington, he invented a machine for laying the wires under ground and was subsequently put in charge of the work. The insulation being poor, however, the plan had to be abandoned, and on Cornell's suggestion the wires were strung on poles, and the line was thus speedily completed. Subsequently Cornell devoted his attention almost wholly to the construction of telegraph lines and the organization of telegraph companies, and was instrumental in forming the Western Union Telegraph Company in 1855. In 1858, having accumulated a large fortune, he settled on a farm at Ithaca, N. Y. He was a member of the first Republican National Convention in 1856, was president of the New York State Agricultural Society in 1862, and was a member of the State Assembly in 1862-63, and of the State Senate in 1864-67. After the passage of the 'Morrill Land-Grant Act' in 1862, he succeeded in getting a bill through the Legislature assigning the whole of New York's land scrip to one institution, and in addition contributed an endowment of \$500,000 toward building such an institution at Ithaca, N. Y. He subsequently (in 1866) bought up the scrip then remaining unsold, located it with great care, and by his skillful management enormously increased the income accruing therefrom to the university. In 1868 'The Cornell University,' so founded, was formally opened. Mr. Cornell also built a public library at Ithaca. Consult *The Life of Ezra Cornell*, by his son A. B. Cornell (New York, 1884).

CORNELL, JOHN HENRY (1828-94). An American musician, born in New York City, and educated in Germany and England. He held several prominent positions as organist in New York, notably at Saint Paul's Chapel (1868-77) and the Old Brick Church (1877-82). His sacred compositions, several of which possess considerable merit, and his theoretical works, include the following: *The Introit Psalms* (1871); *Yesper Psalter* (1861); a *Te Deum*; *Congregational Tune Book*; *Manual of Roman Chant*; *Theory and Practice of Musical Form*; *Primer of Modern Tonality* (1876). The last-mentioned two works attained considerable popularity.

CORNELL COLLEGE. An institution of higher learning, situated at Mount Vernon, Iowa. It was founded by members of the Methodist Episcopal Church in 1853, but was not organized as a college until 1857. The college offers courses leading to the B.A., B.S., B.S. in C.E., and the corresponding master's degrees. The faculty consists of 34 professors and teachers, and the enrollment of students is 382, excluding students in the preparatory department. Among its principal benefactors were Bishop L. L. Hamline, Hon. D. N. Cooley, Hon. W. H. Johnston, Hon. Edgar T. Brackett, and

Capt. E. B. Soper. The principal buildings are College, Science, Chapel, Bowman, and Conservatory halls. The library numbers about 22,000 volumes. Its endowments amount to \$300,000, and its annual income is over \$40,000.

CORNELL UNIVERSITY. An institution of higher education, situated at Ithaca, N. Y. The university owes its origin to the Hon. Ezra Cornell (q.v.), who desired to found an institution where any person could find instruction in any study. Under the Morrill act of 1862 the State of New York received scrip representing 989,920 acres of land as its share of the public lands granted by the Federal Government to the several States for the purpose of establishing colleges of agriculture and mechanic arts. Mr. Ezra Cornell offered \$500,000 as an endowment fund for a university on condition that the State should set aside the proceeds of the sale of its public lands for the same purpose. After much wrangling in the Legislature, this offer was accepted, with the stipulation, however, that the university should offer free tuition to as many students residing in the State as there were Assembly districts. Cornell University was incorporated in 1865, and was formally opened in 1868, with a registration of 412 students. This large matriculation was due, in the first place, to the liberal spirit of the charter, which provided that at no time should the adherents of any one religious denomination compose a majority in the board of trustees; and, secondly, to the low entrance requirements adopted at the new institution, as compared with the high requirements and rigid curriculum maintained at other colleges. The elementary branches were sufficient to admit students to courses in engineering, mechanic arts, and agriculture, while courses leading to the Ph.B. and B.S. degrees were offered to those who could not satisfy the classical entrance requirements. The plan of the whole institution was modeled with a view to the practical tendencies of the times. Its liberal programme was warmly welcomed by such men as James Russell Lowell, Louis Agassiz, Theodore D. Dwight, John Stanton Gould, Goldwin Smith, George William Curtis, and Bayard Taylor, who signified their interest in it by accepting non-resident professorships on its faculty. Andrew D. White gave up for a while the prospects of a political career to become its first president. This auspicious beginning, however, was not maintained. From 1868 to 1882, the university was engaged in a struggle for existence that seriously diminished its students, disheartened its trustees, and brought the whole structure to the verge of bankruptcy. Mr. Cornell, seeing that the State's land scrip, on whose proceeds the university was solely dependent except for the original endowment of \$500,000, was selling at about fifty cents an acre, a sum far less than its ultimate worth, bought up all the unsold 'scrip' and located and transferred to the university before his death over 500,000 acres of the finest timber lands in Wisconsin. But the anticipated advance in forest values did not take place, taxes and cost of administration amounted to over \$60,000 a year, and the university was soon obliged to trench heavily on its capital to meet current expenses. A way of escape that offered in 1880 was blocked by Henry W. Sage, Chairman of the Board of Trustees. In that year a New York syndicate proposed to

buy 275,000 acres of the Western lands for \$1,225,000—an amount that would have released the trustees from their troubles. But Mr. Sage, believing that the lands would go still higher, refused his consent and the bargain fell through. Less than two years later his faith was vindicated; 140,000 acres was sold for \$2,320,000, other sales were made later at increasing prices, and the university has up to the present time realized a net profit of some \$6,000,000. Besides its income from these sources Cornell has received large private gifts. Henry W. Sage gave altogether \$1,175,000; Andrew D. White, \$200,000; Daniel B. Fayerweather, over \$300,000, and Hiram Sibley, John McGraw, Dean Sage, and William H. Sage, more than \$100,000 each.

Out of the 2704 students enrolled in the first five years, 2347 entered on the minimum entrance requirements. In 1872 the university became co-educational, and in 1877, in spite of the constant decrease in attendance, the entrance requirements were raised so as to include plane geometry, physiology, and physical geography. A year of French or German was also added to the primary requirements for admission to the course in letters or science. In 1882 the faculty, including instructors and assistants, numbered but 49. The additions made to the library were few. During this anxious period in the history of the university, the members of the faculty, ill paid and overworked, loyally stood by it, and pursued their work notwithstanding all difficulties. New courses were offered in the departments of civil and mechanical engineering, architecture, agriculture, the sciences, humanities, and military science. After 1882 the university developed and expanded in accordance with the original idea of the founder. The law school, a school of pharmacy (discontinued in 1890), and the Andrew D. White School of History and Political Science, were organized in 1887. The Sage School of Philosophy, which has become known for its work in experimental psychology, was organized in 1890. President Schurman appealed to the State in 1892 for further aid, on the ground that Cornell, although not a State institution in the strict sense of the term, was educating 512 students free of tuition. The Legislature generously responded to his appeal by establishing at Cornell University the Veterinary College in 1894, and the State College of Forestry, the first institution of its kind in the United States, in 1898. A tract of 30,000 acres of forest in the Adirondacks was granted the college for experimental purposes. The situation of Cornell University in a small town prevented it from adding a medical school to its departments, although a medical preparatory course has existed since its inception. In 1898 this problem was solved by establishing a medical college in the city of New York, with a branch at Ithaca, where the first two years of the course may be taken. In the same year the entrance requirements, which had been gradually raised since 1877, were put on a footing equivalent to those of the leading universities in the United States.

Cornell University comprises the following departments and colleges (the attendance given is in all cases that of 1902): (1) The Graduate Department, having charge of all graduate studies pursued at the university under the several faculties. This department offers courses lead-

ing to the degrees of A.M., Ph.D., etc. It numbers 189 students. Twenty-four fellowships, ranging from \$500 to \$600 a year, and 17 scholarships, of the annual value of \$300 a year, are available for students. (2) The Academic Department offers elective courses leading, whether sciences, letters, or the classics are mainly chosen, to the degree of A.B. The attendance is 831. (3) The College of Law offers courses leading to the LL.B. degree, and numbers 198 students. (4) The Medical College, partially conducted at New York City, confers the degree of M.D., and numbers 433 students. (5) The College of Agriculture offers courses leading to the B.S.A. degree, and numbers 188 students. Connected with this college is an agricultural experiment station, established by the Federal Government in 1887. (6) The New York State Veterinary College confers the degree of D.V.M. Its attendance is 59. (7) The State College of Forestry confers the degree of F.E., and numbers 44 students. (8) The College of Architecture confers the degree of B.Arch., and has an attendance of 50. (9) The College of Civil Engineering confers the degree of C.E., and numbers 214 students. (10) Sibley College of Mechanical Engineering and Mechanic Arts, consisting of the departments of mechanical, electrical, experimental engineering, the department of mechanic arts, etc., confers the degree of M.E. Its total registration is 792.

Undergraduates are required, except for special reasons, to take a course of military drill, extending over two years, under the supervision of a United States Army officer.

The government of the university is vested in a board of thirty-nine trustees, the university faculty, composed of the members of the several faculties, having charge of educational matters concerning the university as a whole, and the faculties of the several schools and colleges, who are charged with the administration of their respective departments.

The total attendance, excluding summer-school students and those taking the short winter courses, is 2845. The staff of instruction numbers 367. The principal buildings of Cornell University include the \$500,000 library, the gift of Henry W. Sage; Sage College, a dormitory for women; Boardman Hall, Stinson Hall, and Sibley College. The campus, situated on a hill looking down upon Cayuga Lake and surrounded by gorges, falls, and cascades, is considered one of the most beautiful in the world. Barnes Hall and Sage Chapel represent the religious life of the university. The libraries, including the famous Andrew D. White collection on the French Revolution and the Fisk Dante collection, contain 261,852 volumes, besides 43,000 pamphlets. The income of the university from all sources is about \$800,000 a year. The presidents since its inception have been: Andrew D. White, LL.D. (1865-85); Charles Kendall Adams, LL.D. (1885-92); Jacob Gould Schurman, LL.D. (1892—).

CORNER. A commercial term of United States origin, denoting the operation, or more properly the resultant effect, of acquiring contracts for the delivery of so much of a commodity or of the stock or certificates of indebtedness of a corporation, as to raise abnormally the values thereof to the advantage of the buyers. A corner is 'effective' when those who have contracted to

sell and deliver the stock or commodity are forced, for lack of other supply, to buy it, or the certificates or warehouse receipts representing it, from the buying or cornering pool, at the pool's prices. Conversely a corner is 'smashed' when the buyers, finding their means inadequate to their operations, are forced to throw their holdings on the open market, or when those who have contracted to deliver the stock or commodity are able to obtain it independently of the pool. For the latter reason, because the total supply is not strictly determinable nor all obtainable, attempted corners in wheat and other actual commodities are seldom successful. On the other hand, corners in stocks and certificates having definite total issues may be carried just to the point where they bankrupt the seller; that is to a point where, if the prices are put any higher, the sellers repudiate their contracts and the corner is 'smashed' for lack of a market. The possibility of any considerable corner arises from buying and selling on margin. In this usual and speculative form of stock-dealing the broker or commission house lends the buyer or seller the money needed for the deal, demanding, however, for his own protection, a deposit of five, ten, or twenty per cent. of the face value of the contracts made. The dealer is thus enabled to buy or sell stock to a value of from five to twenty times the amount of his actual capital, and a combination of large dealers can without difficulty buy or sell the whole stock issue of the largest trusts or railroads. If, now, such a combination sells, that is, agrees to deliver, practically the entire issue of a road, they may find when they attempt to buy the stock to fill their contracts that it is already held by the very persons to whom they contracted to sell it. That is, a rival combination has been secretly working against them, and the sellers of the stock are forced to buy the stock at exorbitant prices and then sell it back to those for whom they bought it. This is the process technically known as 'squeezing the shorts.' Until recent years nearly all corners of importance were manipulated for speculative reasons: for the immediate gain of the operators, that is, and without any investment purpose. Of such a nature was the famous gold corner, organized in New York by Jay Gould and his associates. This corner, culminating on "Black Friday," September 24, 1869, was 'smashed' by the release of Government gold by the Secretary of the Treasury—thus rendering the 'shorts' or sellers of gold independent of the cornering syndicate who held the gold which the 'shorts' had agreed to sell. Latterly, however, many corners or quasi-corners have resulted incidentally, and often to the regret of all concerned, from the effort of rival combinations to buy the control of some large trust or railroad for permanent investment and administrative purposes. Of this kind was the corner in the Northern Pacific Railroad in May, 1901, when the price of the stock rose abruptly to 1000 bid. For an account of the gold corner of 1869, consult: Boutwell, *Reminiscences of Sixty Years in Public Affairs* (New York, 1902). For an interesting account of the actual manipulation of a corner, consult Frederic, *The Market Place* (London, 1899). See MARGIN DEALS; SHORTS; SPECULATION; TRUSTS.

CORNET (OF., Fr. *cornet*, from ML. *cornetum*, *corneta*, bugle, dim. of *cornu*, horn). A stop or series of pipes in an organ, intended to imitate the tone of an obsolete wind instrument which has been superseded by the oboe. The **CORNET-À-PISTON** (Fr., cornet with pistons), a modern brass or silver wind instrument of the trumpet kind, has two or three valves, and in brass bands takes the soprano and contralto parts. It was first introduced in France as an orchestral instrument. The cornet-à-piston produces very penetrating tones, though less powerful than those of the trumpet. The rapidity of execution in runs, trills, staccatos, etc., which can be attained on this instrument, combined with the pealing quality of its tones, have made it the favorite solo instrument in open-air band-concerts; but this very resonance will most likely keep it out of the symphonic orchestra.

CORNET (Fr. *cornette*, standard, so called as having two points or horns, dim. of *corne*, from Lat. *cornu*, horn). Formerly a junior or subaltern commissioned rank in the British cavalry, so called because the cornet carried the flag (cornet). Its equivalent rank in the infantry was the ensign (q.v.).

CORNETO, KŌR-nā'tō, or **CORNETO TARQUINIA** (from It. *cornio*, horn). A town of central Italy, about 12 miles north of Civitavecchia, occupying a commanding eminence on the left bank of the Marta, and 2 or 3 miles from the Mediterranean, over which it has an extensive view. Corneto arose near the ruins of the Etruscan city of Tarquinii, and was built in part from its remains. It was erected into a city by Pope Eugenius IV, in 1432; but the picturesque old battlemented walls and towers which surround it are said to belong to an earlier period. During the faction wars of the Guelphs and the Ghibellines, this city maintained a firm allegiance to the popes. Population (commune), in 1901, 7219. The scanty remains of Tarquinii lie about a mile and a half from Corneto. This city was regarded as one of the most ancient and important of the Etruscan cities, and took part in the wars with Rome in the fourth century B.C.; but later, with the rest of Etruria, came under the Roman dominion. It seems to have been destroyed by the Saracens. The Necropolis of Tarquinii, which is far the most important relic of the ancient city, is on the same hill as the modern city, and extends into the neighboring plain. It is of great extent, and has been said to cover 16 square miles. Many tombs have been opened, but most of them had been plundered in early times. The most important tombs are those decorated with paintings on the walls, among which are noteworthy the Grotta delle Iserizioni (probably one of the earliest), Grotta del Barone, Grotta Querciola, Grotta del Convito Funebre, Grotta del Tifone, and Grotta dell' Orco. Consult: Dennis, *Cities and Cemeteries of Etruria* (London, 1878), and Dasti, *Notizie di Tarquinia Corneto* (Rome, 1878).

CORN-FLAG. See IRIS.

CORNFLOWER, or **BLUEBOTTLE** (*Centaurea Cyanus*). A plant of the natural order Composite, indigenous to Europe, where it is a common weed in grain-fields, and whence it has spread to other countries. Its long, slender, branched stems, which reach a height of from one to two and one-half feet, bear

CORNFLOWER, ETC.



1. COCKLEBUR (*Xanthium strumarium*).

2. CORNFLOWER (*Centaurea cyanus*).

3. CALISAYA (*Cinchona calisaya*), var. *Ledgeriana*.

4. COLCHICUM (*Colchicum autumnale*).

5. COCA (*Erythroxylon coca*).

6. NIGHT-BLOOMING CATCHFLY (*Silene noctiflora*).

terminal flower-heads about one and one-half inches in diameter during summer and autumn. These flower-heads have a wreath-like appearance, due to the neutral ray florets, and from early times have been favorites for making garlands. Being hardy and of easiest culture, the cornflower has become one of the most popular annuals in American flower-gardens, and has developed many varieties, which range through various shades from deepest blue to white. In the United States it has at least fifteen names, the commonest of which is perhaps bachelor's-button, a name also applied to two other plants—*Ranunculus acris* and *Gomphrena globosa*.

CORNHILL. An important London street, named from a corn market formerly held there. The Tun, a prison, and the Standard, a water-conduit, stood upon it in mediæval times.

CORNIANI. kôr'nê-î'nê, GIAMBATTISTA, Conte di (1742-1813). An Italian literary historian, born at Orzi-Nuovi (Brescia). In his youth he studied law and wrote for the theatre; but afterwards he became connected with the College of Brescia and published some works on agriculture. In 1797 he was made one of the Tribunal of Cassation of the Cisalpine Republic. The work for which Corniani is best known is a literary history of Italy, *I secoli della letteratura italiana* (1804-13; new edition by Predari, 1854-56).

CORNICE (OF., It. *cornice*, ML. *corniæ*, border, from Gk. *κορωνίς*, *korōnīs*, garland, from *κορωνός*, *korōnōs*, curved; connected with Lat. *corona*, crown, fr. *cor.* circle). In architecture, either the crowning member of a wall or a projection from it, such as a coping, or the crown of a minor division, as a colonnade. It has been used in nearly every style. The usual Egyptian cornice consists of a fillet and cavetto molding, as the upper member of a simple entablature crowning all the main walls. Ancient Oriental architecture did not develop any style of cornice. It was reserved for Greek architecture to establish a type of cornice as the upper member of the entablature of the different orders, immediately above the frieze, as is more fully explained under ENTABLATURE (q.v.). The slanting cornice of a gable is called *raking cornice*, to distinguish it from the horizontal cornice. The Doric cornice is crowned by a strongly projecting corona, the upper part of which is the *cymatium* or *cyma*; the lower part is usually the *tenia*. The corona rests on a thin bed-mold of one or two simple moldings. Along its horizontal edges are placed *antefixes* (q.v.). The under surface, or *soffit*, of the cornice is decorated with *mutules* (q.v.). In the more decorative Ionic cornice there is no very projecting broad, flat *tenia*, but a group of richer moldings gradually projecting. The corona is very high, the *ogee cyma* being richly decorated between two fillets, and connected with the *tenia* by a smaller regular *cyma*; the lower part of the cornice consists of a flat denticulated projection immediately above the frieze. The Corinthian cornice is both richer and more varied, its principal variation being the addition, in its central section, of *volute-like mutules* (q.v.) and *modillions* (q.v.), and the adornment of the *tenia* with *egg-and-dart* and other ornamentation. It was not fully developed until Roman times, when it was also used in the Composite

order, and the characteristic forms of the different Greek orders were mingled. In early Christian and mediæval architecture the variety of forms of cornice is too great to allow of classification or description. Some resemblance to the classic cornice is preserved in the rich churches of the fifth and sixth centuries in Syria, and the classic type is even more closely followed in the mediæval churches of some parts of Italy, especially Rome and its neighborhood; and it was, of course, revived by the Renaissance. Mediæval cornices are often supported on foliage and lines of small, blind arches: simple in the Romanesque, freer and richer in the Gothic style. The mediæval surface decoration was usually in very high relief, often in part detached from the ground. The imitation of every kind of foliage and flower, as well as the use of traditional and new geometric and schematic forms, gives great scope to this architectural member. In its simplest form it consists often of a projecting table supported on corbels, with or without arches.

The term is also used in modern terminology for the upper termination of a piece of furniture, a window or door casing, or anything that acts as a frame, of whatever material it may be. Consult the works cited under COLUMN; ENTABLATURE; which also discuss cornice.

CORNICHE, kôr'nêsh', ROUTE DE LA (Fr., cornice road). A renowned carriage road following the coast line of the Riviera between Nice and Genoa. It is noted for its striking views, particularly between Nice and Mentone, and is much traveled in preference to the railway.

CORNIDES, kôr'nê-dēs, DANIEL VON (1732-87). An Hungarian historian, born at Szent-Miklós. He studied philosophy and theology at Erlangen, Germany. As the companion of Count Joseph Teleki he visited Italy, Germany, and France, and while in Germany contributed greatly to the enlargement of the Hungarian department in the University of Göttingen and other institutions. In 1784 he was appointed librarian and professor of heraldry and diplomacy at the University of Pest. His principal works include: *Regum Hungariae, qui Saeculo XI. Regnarere, Genealogia* (1778); *Bibliotheca Hungarica* (1792); *Commentatio de Religione Veterum Hungarorum* (1791); *Vindiciae Anonymi Bæw Regis Notarii* (1802).

CORNIFEROUS SERIES (from Lat. *cornu*, horn + *ferre*, to bear). In American geology, the second of the four great divisions of the Devonian system. It includes the Schoharie and Corniferous stages. The rocks of the Corniferous series—mostly sandstones—are found along the Appalachians, in Ohio, and in Canada, where they inclose valuable deposits of petroleum. See DEVONIAN SYSTEM.

CORNIFICIUS, kôr'nê-fish'f'ūs, QUINTUS (?-c.40 B.C.). A Roman general and writer on rhetoric; a contemporary of Cicero. During the Civil War he supported the party of Cæsar, by whom he was appointed Governor of Syria and afterwards of Africa. After Cæsar's death he maintained the latter province for the Senate; but on the establishment of the Second Triumvirate was defeated and slain in battle by T. Sextius. Cornificius appears to have been almost equally distinguished for his literary abilities, which are frequently mentioned by Quintilian.

Catullus, and Ovid. Some scholars now attribute to him the authorship of the rhetorical treatise, *Rhetorica ad Herennium*, commonly ascribed to Cicero. Consult the editions by Kayser (Leipzig, 1854), Friedrich (part i., vol. i., of the Teubner Cicero, Leipzig, 1884), and Marx, who refuses to recognize the authorship of Cornificius, and has published the text under the title, *Incerti Auctoris de Ratione Dicendi ad C. Herennium Libri IV.* (Leipzig, 1893); also Kröhnert, *Die Anfänge der Rhetorik bei den Römern* (Memel, 1871).

CORNING. A city and one of the county seats of Steuben County, N. Y., 18 miles west-northwest of Elmira; on the Chemung River, and on the New York Central, the Erie, and the Lackawanna railroads (Map: New York, C 3). It has extensive manufactures of cut and flint glass, terra-cotta goods, building and paving brick, lumber, sash and blinds, etc. Among the more prominent buildings may be noted the city hall, free academy, and Saint Mary's Orphan Asylum. Corning was incorporated in 1849 as a village, and in 1890 as a city. Under the revised charter of 1899 the Mayor holds office for two years, and the city council is elected by wards. The river, police, and civil-service commissioners, fire wardens, and the board of health are nominated by the Mayor, with the consent of the council; other offices are filled by popular election. Population, in 1890, 8,550; in 1900, 11,061.

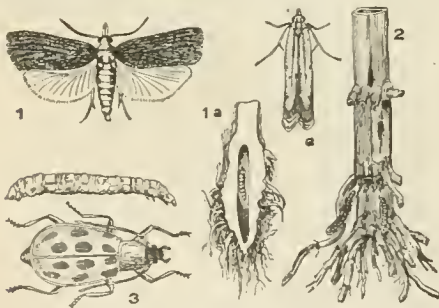
CORNING, ERASTUS (1794-1872). An American capitalist, born in Connecticut. In 1814 he settled in Albany, N. Y., where, as owner of the large iron-works there, and later as a banker, he accumulated a large fortune. He was for many years one of the great railroad owners and operators of the country, being largely interested in the formation of the New York Central Railroad, of which he was president for twelve years. He was also active in promoting the welfare of popular education, and, taking part in public affairs, served as a Democrat in Congress in 1857-59 and again in 1861-63.

CORN-INSECTS. Insects affecting Indian corn are numerous and varied.—*Plant Lice*: An aphid (*Rhopalosiphum maidis*) is widely dis-

Washington, 1888-90.)—*Beetles*: Certain weevils attack the roots and stems, especially bill-bugs of the genus *Sphenophorus*, the grubs burrowing in the bulbs of the young plants and eating the roots of the tender leaves near the surface of the ground; their work is sometimes confounded with that of a cutworm (larva of *Hadena stipata*). Fall plowing is useful against both. The larvae of several flea-beetles (*Diabrotica*) are often styled corn root-worms. The adult beetles, closely related to the cucumber, melon, and squash beetles, feed on the pollen and silk of corn and the larvae on the roots, and both do great damage in the Mississippi Valley. Rotation of crops is the most effective remedy. Various other beetles are locally or occasionally harmful, and one is prominent as destructive to grain, the corn silvanus (*Silvanus Surinamensis*). From an economic standpoint this is the most important member of the family Cucujidae. It is a flat beetle with the edges of the prothorax saw-toothed. Besides Indian corn, wheat, and other grain, it infests dried fruits and other food-stuffs. Another member of the same family, a bright-scarlet beetle, of the genus *Cucujus*, also infests stored grain.—*Moths*: The larvae of moths, 'cutworms' and 'webworms,' do much damage. The worst species, however, is the 'corn-worm,' or 'corn-bud worm,' the caterpillar of a noctuid moth (*Heliothis armigera*), which destroys the flower-buds. (See COTTON-INSECTS.) The large 'stalk-borer,' often highly injurious in Southern fields, is the larva of a phalænid moth (*Diatraea saccharalis*), which perforates the stems at their base, where, in the axils of the starting leaves, the parent moth lays its eggs in spring. This insect is better known as the sugar-cane borer of the American tropics. Tidy methods of farming are the best preventive. Other smaller borers are the caterpillars of the moths *Pempelia lignosella* and *Gortyna nitela*. The chinch-bug (q.v.) is also an enemy of Indian corn. Consult: Riley, "Insects of Missouri," in *United States Department of Agriculture, Division of Entomology, Reports 1 and 3* (Washington, 1881); Lintner, "Insects of New York," in *Agricultural Experiment Station Report 1* (Albany, 1882); Comstock and Slingerland, "Wire-worms," in *Agricultural Experiment Station Bulletin 33* (Ithaca, 1891).

CORNISH LANGUAGE AND LITERATURE. The Cornish language belongs to the British subdivision of the Celtic family, and stands, on the whole, nearer to the Old Breton than to the Old Welsh. (See CELTIC LANGUAGES.) It ceased to be a living language in the eighteenth century. Dolly Pentreath (who died in 1775) is traditionally said to have been the last person who spoke it; but some knowledge of it apparently survived her, and a small number of Cornish words are used to this day in the English dialect of Cornwall.

Only a small quantity of Cornish literature has been preserved. For the Old Cornish period nothing exists but a few proper names in old records. For Middle Cornish we are somewhat better off. A vocabulary of the twelfth or thirteenth century has been preserved, and also a few texts dating from the fourteenth century to the seventeenth. The Middle Cornish literature, like the Middle Breton, consists almost entirely of religious poetry and drama.



INSECTS INJURIOUS TO INDIAN CORN.

(1) Larger corn-stalk borer (*Diatraea*): a, boring larva within the base of the stalk. (2) Smaller borer (*Pempelia*): a, the moth at rest. (3) A flea-beetle (*Diabrotica*) and its root-destroying grub.

tributed by means of its migratory winged swarms; it lays its eggs on the stems of the corn beneath the ground, and the young attack the roots: the ants assist this injury by carrying females heavy with young and colonizing them upon the roots. (See *Insect Life*, I., III.,

For Old Cornish, consult Stokes, "The Manuscripts in the Bodmin Gospels," *Revue celtique*, vol. i. (Paris, 1870). The Middle Cornish vocabulary is printed in Zeuss, *Grammatica Celtica*, edited by Ebel (Berlin, 1868-71). For the other monuments, consult: Norris, *The Ancient Cornish Drama* (Oxford, 1859); Stokes, "Pascon Agan Arluth," *Transactions of the Philological Society* (London, 1861-62); and *Beunans Meriasek* (ib., 1872).

CORN LAWS. A name given in England to the long series of statutes dating as far back as the reign of Edward III., and terminating only in the year 1846, which had for their object the regulation of the trade in grain. The tenor of these laws varied with the idea which was uppermost in the minds of the legislators. At one time designed to secure a proper supply of grain, the exportation of grain was prohibited, or allowed only when a surplus of the home supply revealed itself in the low price for grain. Later the underlying principle was frankly the encouragement and support of the agricultural interests, resulting in the prohibition of the importation of grain, or permitting it only when the price of grain was extremely high and importation seemed unavoidable to prevent famine. At times, moreover, in the long and varied history of this legislation, resort was had to bounties as a means of encouraging and promoting home production. The shifting of legislation attracted little comment and less agitation until the beginning of the nineteenth century. At that time the manufacturing interests grew restive under the restrictions which were placed upon the trade in grain, and early in the century something in the nature of a compromise was made by the adoption of a sliding scale in the duties on importation. The object of this device was to reduce the import duties in proportion as the price of grain increased, so that at famine prices grain might be imported duty free. By the act of 1828, at the price of 62s. a quarter for wheat, the import duty was £1 4s. 8d. For every shilling less in the price, a shilling was added to the duty, but when the price rose above this point the duty decreased by a larger ratio than the rise in price. At the price of 69s., the duty was 15s. 8d., and at 73s. the duty sank to its minimum of 1s. Such an arrangement not only promoted speculative operations, but also prevented foreign countries from furnishing grain habitually for the British market.

This legislation was obviously in the interest of the landowners, but as the tendency of Great Britain to be an importing rather than an

virtually an attempt to aggrandize the landed interest by pressure upon the food of the people. The manufacturing interests, which were now rapidly coming into power, devoted their energies to combating this principle, which increased the cost of living, and, through wages, the cost of manufacturing. But the public at large, though conscious that the laws were some way improper, or at variance with the principles of political economy, did not, till the very last, earnestly unite in calling for repeal. There was a powerful party who represented with wonderful plausibility that these restrictive statutes were identified with the best interests of the country. Their arguments might thus be summed up: (1) Protection was necessary, in order to keep certain poor lands in cultivation. (2) It was desirable to cultivate as much land as possible in order to improve the country. (3) If improvement by that means were checked, England would be dependent on foreigners for a large portion of the food of the people. (4) Such dependence would be fraught with immense danger; in the event of war, supplies might be stopped, or the ports might be blockaded, the result being famine, disease, and civil war. (5) The advantage gained by protection enabled the landed proprietors and their tenants to encourage manufactures and trade; so much so, that if the corn laws were abolished, half the country shopkeepers would be ruined; that would be followed by the stoppage of many of the mills and factories, and no one would venture to say what would be the final consequences. It cannot be uninteresting to put on record that these arguments exercised a commanding influence over the laboring classes, the small town shopkeepers, almost all the members of the learned professions, and a considerable section of both Houses of Parliament. Yielding at length to the continued agitation, and recognizing that England's prosperity lay in the development of her manufactures rather than in the further encouragement of agriculture, Sir Robert Peel, in 1846, at the time of the Irish famine, effected the repeal of the Corn Laws. (See ANTI-CORN-LAW LEAGUE; CORBEN, RICHARD.) The area devoted to wheat cultivation in England is less to-day than it was fifty years ago, although the population has greatly increased. Modern methods of communication, however, have opened up new areas of supply, and the development of manufactures and commerce has amply compensated for the loss in agricultural production.

The following table shows the immediate effect of the repeal of the Corn Laws:

IMPORTS OF FOREIGN WHEAT, CURRENT PRICES OF WHEAT, AND DECLARED VALUE OF ALL BRITISH EXPORTS FROM 1801 TO 1859

AVERAGE PERIOD OF TEN YEARS	Average amount of wheat imported	Average price of wheat during each period	Average total declared value of all British exports
	Bushels	s. d.	£
1801 to 1810.....	600,946	81 5	40,737,970
1811 " 1820.....	458,578	84 11	41,506,794
1821 " 1830.....	534,992	58 3	36,000,536
1831 " 1840.....	907,638	56 10	45,249,037
1841 " 1850.....	2,877,999	53 3	57,412,494
1851 " 1859.....	4,547,311	54 9	103,253,189

exporting country had already become manifest, it seemed clear that the effort to increase home production by the pressure on importation was

Coincidentally with an increased importation of food-stuffs there was a notable expansion of foreign trade, as shown in the exports. In later

years imports are measured in hundredweights. The increase in grain imports is shown in the following table:

YEAR	Wheat and wheat flour in cwts.	Value of all breadstuffs
		£
1860.....	31,841,926	31,676,353
1870.....	39,906,115	42,502,252
1880.....	68,459,814	62,857,269
1890.....	82,381,591	53,484,584
1900.....	98,597,450	58,942,390

In the meantime the aggregate value of all British imports and exports has risen from £376,000,000 in 1860 to £698,000,000 in 1880, and £877,000,000 in 1900. The growing dependence of Great Britain upon foreign sources of supply for breadstuffs is reflected in the decline of the area sown in wheat, which in 1870 was reported as 3,773,663 acres, and as 1,845,042 acres in 1900. Russia and other European countries contribute to the British imports, as does also India, but the principal sources whence imports are drawn are shown in the following statement:

IMPORTS OF WHEAT, GRAIN, AND FLOUR IN 1900

	Cwts.
United States.....	57,418,064
Argentina.....	18,769,000
British North America.....	7,997,626
Australasia.....	4,057,811
All other countries.....	10,354,949
Total.....	98,597,450

BIBLIOGRAPHY. The text of the Corn Laws is to be found in *British Statutes*, revised edition (16 vols., London, 1882-1900), and the speeches on both sides of the question in Hansard, *Parliamentary Debates* (1815-46). A comprehensive and accurate presentation of the whole subject and its bearing on trade is given in McCulloch, *Dictionary of Commerce and Commercial Navigation* (London, 1870); Acland and Ransome, *Political History of England* (London, 1894), summarizes the Corn Laws previous to 1815, and the progress of legislation from that time until 1846, when the Corn Laws were repealed. Other sources of information are: "The First and Second Reports from the Select Committee on the Epworth (Corn Law) Petitions," *Great Britain Parl. Papers, Sess. 1843*, vol. xi.; Wilson, *Influences of the Corn Laws* (London, 1840); Thornton, *Historical Summary of the Corn Laws* (London, 1841); Platt, *History of the British Corn Laws* (London, 1845); Bastiat, *Œuvres complètes*, vols. i., iii. (Paris, 1855); Morley, *Life of Richard Cobden* (London, 1881); McCarthy, *The Epoch of Reform, 1830-50* (London, 1882); and for a full bibliography, *New York Public Library Bulletin*, vol. vi., No. 5 (New York, 1902).

CORNO. kōr'nó, MONTE (Mount Horn). The highest peak of the Apennines (q.v.).

CORN-OIL, CORN-PITH. See MAIZE.

CORN PLANTER (1732-1836). A celebrated half-breed chief of the Seneca Indians, the son of a trader named John O'Neil. During the French and Indian War he led a war-party of the Senecas which had joined the French against the English, and took part in the defeat of Braddock in 1755. During the Revolutionary War he joined the English, took an active part in the

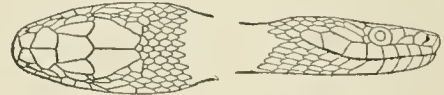
border conflicts in New York, and seems to have been present at the massacre of Wyoming. Afterwards, however, he became a steadfast friend of the whites, and, with Red Jacket, directed the affairs of his tribe for many years. His Indian name was Garyan-Wah-Gah.

CORN-SALAD, or LAMB'S-LETTUCE (*Valerianella*). A genus of plants belonging to the natural order Valerianaceae. The species are annual plants of humble growth, with repeatedly forked stems, and very small flowers, native of Europe. Some of them are frequently used as spring salads, and sometimes as a substitute for spinach, particularly the common corn-salad (*Valerianella oleraria*). For early spring plants the seed is sown in September and cultivated, mulched, and wintered like spinach. Corn-salad lacks pungency as a salad plant, but comes early in the spring when other salad plants are scarce. For illustration, see SALAD PLANTS.

CORN-SHELLER. See MAIZE.

CORN-SMUT. See SMUT.

CORN-SNAKE (so called from its color, which resembles that of red Indian corn).



CORN-SNAKE (*Coluber guttatus*).
(Plates of the top and side of the head.)

Either of two harmless snakes in the southern United States: (1) *Coluber guttatus*, found in Virginia and southward, two and one-half feet long, reddish-brown with black bordered brick-red blotches; (2) the milksnake (q.v.).

CORN-STALK (c.1720-77). A celebrated Shawnee Indian chief. He commanded the Indians in the stubborn battle of Point Pleasant (q.v.) on October 10, 1774, during Lord Dunmore's War, and won the praise even of the whites by his great bravery and address. After the battle he made a treaty of peace with the Virginians, in spite of the opposition of a part of his tribe, and kept it loyally until 1777, when the Shawnees being incited to renew hostilities, he appeared at Point Pleasant in person and notified the settlers that he might find himself forced 'to run with the stream.' The settlers decided to detain him and his son as hostages, and soon afterwards, while still in confinement, the two were treacherously murdered by some whites infuriated by continued Shawnee outrages.

CORNSTALK DISEASE. A disease that affects cattle, and occasionally horses and sheep. The cause of the disease is still undetermined. By some investigators it has been considered as due to corn-smut or to the organisms of the Burrill disease of corn. Others have believed that a poisonous principle is sometimes present in cornstalks which causes the death of animals. The name *toxemia maidis* for the disease was based on this theory. In some localities the disease has been supposed to be due to the combined action of indigestion and some poisonous substance absorbed by the corn, for example, saltpeter. In a case of cattle-poisoning in

Kansas from eating dried cornstalks, an investigation revealed the presence of large quantities of potassium nitrate. This substance had formed in small white crystals which resembled mold, but was readily recognized by tasting. By cutting a cornstalk in two and tapping it on a table a considerable quantity of powdered nitrate of potash was jarred out. A chemical analysis showed that this substance constituted 18 per cent. of the dry weight of the cornstalks. Feeding experiments with potassium nitrate showed that 500 grams would kill an adult animal weighing 1200 pounds.

The symptoms are those of violent digestive disturbances followed by delirium and complete unconsciousness. A pronounced weakness of the hind parts is usually observed, which finally leads to paralysis.

Corn-smut has been extracted with alcohol and injected into guinea-pigs with negative results, and no poisonous alkaloid has been isolated by chemical means. Corn affected with the Burrill corn disease has been fed to cattle without producing any poisonous effects. Until more is known about the cause of the disease it is impossible to suggest a rational treatment.

CORNU, kôr'nû', JULIUS (1849—). A Swiss philologist, born at Basel. He was made professor of Romance philology in his native town, and in 1877 was called to the chair of that study in the University of Prague. Among his works are: *Phonologie du Bagnard* (1877); *Glanures phonologiques* (1878); *Etudes sur le poème du Cid* (1881-1900).

CORNUCOPIA (Lat., horn of plenty, from *cornu*, horn + *copia*, plenty). The horn of plenty—regarding the origin of which several fables are told by the ancient poets—is generally placed in the hands of figures emblematical of Plenty, Liberality, etc., who are represented as pouring from it an abundance of fruits, corn, etc. It is frequently used in both architecture and heraldry. On the arms of banks and other public institutions it is often represented as pouring forth coins.

CORNU'TUS, LUCIUS ANNÆUS. A Stoic philosopher of the time of Nero. He was a native of Libya, but a resident of Rome. He was the teacher and friend of Persius Flaccus, who left to him all his books and a large sum of money. He took the books, but gave the money to the sisters of the donor. Although he was a friend of Nero, the tyrant banished him because he did not like his advice as to the number of books in which he (Nero) proposed to write the history of the Romans. Cornutus was a voluminous writer, but little is known concerning his works. His treatise in Greek, *On the Nature of the Gods*, is extant. It is edited by Lang (Leipzig, 1881).

CORNWALL (AS. *Cornucallas*, from Welsh, Ir., Bret. *corn*, horn, Lat. *cornu*, Gk. κέρα, *keras*, Goth. *hairu*, Eng. *horn* + AS. *ucallas*, strangers, *Wealh*, Welsh. Ger. *welsch*, foreign, Lat. *Volca*, name of a people). A maritime county forming the southwest extremity of England (Map: England, B 6). Its area is 1357 square miles, most of which is arable or in meadow and pasture. Cornwall is a mining as well as an agricultural county, and has important pilchard fisheries. The chief towns are Bodmin (the county town), Launceston, Penzance, and Falmouth. Population, in 1891, 322,571; in 1901, 323,000.

Cornwall is rich in remains of the ancient Celtic culture. These comprise cromlechs or dolmens, found chiefly in the Land's End district; monoliths, circles, and avenues of stone, caves, cliff and hill castles. The products of the Cornish tin-mines were famous in the ancient world, and furnished the Phœnicians with one of their chief articles of trade. The absence of Eastern coins and inscriptions, however, would seem to indicate that the Phœnicians never set foot in Britain, but carried on their trade indirectly through Gaul. After the Saxon Conquest Cornwall constituted part of the British Kingdom of Damnonia, which held out against the kings of Wessex till 926, when Athelstane captured Exeter. At the time of the Norman Conquest the Saxons were in full possession of the land. Christianity was introduced probably as early as the fifth century, and the inhabitants maintained an independent priesthood till the tenth century, when the country was annexed to the see of Canterbury. William the Conqueror gave nearly the whole of Cornwall to his half-brother, Robert of Montain, who was followed by a line of powerful earls, of whom the most celebrated was Richard, the second son of John, elected in 1257 King of the Romans. In 1336 Cornwall was created a duchy for the Prince of Wales, by whom it has continued to be held. During the Civil War the inhabitants of Cornwall were intensely loyal, and supplied Charles I. with some of his bravest soldiers. Royalist victories were won at Braddock Down (January 19, 1643) and Stamford Hill (May 15, 1643). From Sudeley Castle Charles I. on September 10, 1643, issued a proclamation to the people of Cornwall, thanking them for their great devotion. Copies of this letter are still to be seen in a number of churches. See CORNISH LANGUAGE AND LITERATURE.

CORNWALL. A port of entry and capital of Cornwall and Stormont County, Ontario, Canada; on the Saint Lawrence River, the Cornwall Canal, and the Ottawa and New York Railway, 67 miles southwest of Montreal (Map: Ontario, J 2). It has excellent water-power, and one of the largest of Canadian woolen mills, besides paper, flour, cotton mills, etc. It has several churches and schools, and its lacrosse club is one of the foremost in the Dominion. The United States is represented by a consular agent. Population, in 1891, 6805; in 1901, 6704.

CORNWALL. A village in Orange County, N. Y., 55 miles from New York City; on the Hudson River, a little north of the Highlands, and on the Erie and West Shore railroads (Map: New York, F 4). It is in a picturesque region, much frequented as a place of summer resort. Idlewild Park and Storm King Mountain are among the prominent points of interest. The village has a large carpet-mill, which employs some 500 persons. There is a public library. Population, in 1900, 1966.

Cornwall was settled about 1684, became a precinct in 1764, a township in 1778, and was incorporated in 1885. From the original township, Highlands, Blooming Grove, and Monroe, besides parts of Chester and Hamptonburg, have since been taken. Consult: Eager, *History of Orange County* (Newburgh, 1846-47), and Beach, *Cornwall* (Newburgh, 1873).

CORNWALL. Regan's husband in Shakespeare's *King Lear*; a hard, cruel man, well 'matched and mated' with his cruel wife.

CORNWALL, BARRY. See PROCTER, BRYAN WALLER.

CORNWALLIS, CAROLINE FRANCES (1786-1858). An English author. She was born July 12, 1786, and was a daughter of William Cornwallis, rector of Wittersham and Elam, in Kent. As a child she was precocious. Later she acquired a knowledge of Latin, Greek, Hebrew, and German, and studied philosophy, theology, history, natural science, social science, politics, and even law. She refused an offer of marriage from Sismondi; but later for a time occupied his house, in Pesceia, Italy. Her first work, *Philosophical Theories and Philosophical Experience, by a Pariah*, appeared in 1842. It was the first of a series entitled "Small Books on Great Subjects," which she had formed the idea of writing with the help of a few friends. Of the twenty-two volumes of this series, which appeared between 1842 and 1854, all the most important were written by herself. The subjects discussed were various—the connection of physiology and intellectual science, ragged schools, grammar, criminal law, chemistry, geology, Greek philosophy, and the history and influence of Christian opinions. The series attracted much attention in England and the United States. She died January 8, 1858. Although a voluminous author, her name was at her death unknown to the world, and it remained unknown until the publication of her *Letters and Remains* (1864).

CORNWALLIS, CHARLES, first Marquis and second Earl (1738-1805). An English general and statesman. The son of the first Earl Cornwallis, he was born in London, December 31, 1738. After an education at Eton and Cambridge, he entered the army, and served as aide-de-camp to the Marquis of Granby in the Seven Years War. In 1760 he was elected member of Parliament for Eye; in 1766 received his promotion as colonel; in 1770 was made governor of the Tower of London; and in 1775 became major-general. Though personally opposed to the war with America, he went with his regiment thither, and the first successes of the British arms were, in the main, due to him. After the battle of Long Island, in which he took a prominent part, he pursued Washington through New Jersey. A detachment of his army, consisting of Hessians, was captured by Washington at Trenton, December 26, 1776, and part of his forces suffered a defeat at Princeton, January 3, 1777. He had the principal share in the victory of the Brandywine, September 11, 1777, after which he secured for the British the command of the Delaware River. In disgust at Howe's failure to grasp the critical situation of affairs and to attempt operations on a large scale, Cornwallis sent in his resignation, which the King refused to accept. He served under Clinton at the reduction of Charleston in 1780, achieved a great victory over Gates at Camden, S.C., on August 16 of that year, and defeated Greene at Guilford Court House, N. C., March 15, 1781. He was in the end out-generaled by Greene, and withdrew into Virginia, where he carried on a vigorous campaign against Lafayette, but without avail. Finally he was shut up in Yorktown by Washington and Ro-

chambeau, aided by a French fleet under De Grasse, and was compelled to surrender on October 19, 1781. With the surrender of Cornwallis the triumph of the American cause was virtually achieved. Although the disaster resulted in the resignation of the British Ministry, Cornwallis escaped censure owing to royal favor. In 1786 he was appointed Governor-General of India and Commander-in-Chief, and distinguished himself by his victories over Tippu Sahib, and by his indefatigable efforts to promote the welfare of the natives. He returned from India in 1793, when he was raised to the rank of Marquis. Appointed Lord Lieutenant of Ireland, he succeeded in quelling the rebellion of 1798, and established order in a manner that gained him the good will of the Irish people. As Plenipotentiary to France he negotiated the Peace of Amiens. Re-appointed Governor-General of India in 1804, he died at Ghazipur, in the Province of Benares, October 5, 1805, on his way to assume the command of the army in the upper provinces.

Consult: Marshall, *Memoir* (Gateshead, 1806); Lord Cornwallis's *Correspondence*, edited by Ross (London, 1859); Johnston, *The Yorktown Campaign* (New York, 1881); and Seton-Karr, "The Marquess Cornwallis," in *Rulers of India* (Oxford, 1890).

CORO, kō'rō, or SANTA ANA DE CORO. A city of the State of Falcón, Venezuela, situated east of the Gulf of Coro (Map: Venezuela, D 1). It is engaged in cattle-raising, and is a centre for interior commerce. Coro contains several churches, interesting for their antiquity, though they either have been rebuilt or lie in ruins. La Vela, its port, which is six miles to the east, has a good harbor and a trade with the Dutch West Indies, and is the residence of a United States consular agent. Population, in 1889, 9452. Coro, one of the oldest cities in Venezuela, was settled in 1527, and for a time was the Spanish capital of Venezuela. It was created the first bishopric of Venezuela in 1531, but subsequently the see was removed. Its decline dates from the transference of the governmental and ecclesiastical authorities to Carácas. It was the objective point of Miranda's first descent upon Venezuela in 1805, when he led an abortive expedition against the Spanish in the hope of precipitating the revolution of the Spanish-American colonies.

COROADO, kō'rō-á'dó (Port., crowned, in allusion to a peculiar style of wearing the hair). A name without ethnic significance, applied by the Portuguese to several Brazilian tribes, notably to a people in the Province of Rio Grande do Sul, who use arrows five feet in length and clean and preserve the bones of their dead.

COROLLA (Lat., garland, dim. of *corona*, crown). In flowers, the inner one of the two sets of floral leaves. The individual parts are called 'petals,' and they are usually delicate in texture and variously colored, forming the showy part of the flower. In case they are absent the flower is said to be 'apetalous.' The corolla is supposed to serve as an attraction to insects, so that the flower may secure cross-pollination. See FLOWER.

COR'OLLA'RY (Lat. *corollarium*, deduction, gratuity, money paid for a garland, from *corolla*, garland). A proposition the truth of which appears so clearly from the proof of another

proposition as not to require separate demonstration. For example, having proved that the angles at the base of an isosceles triangle are equal, it follows as a corollary that an equilateral triangle is equiangular.

COROMANDEL COAST (Skt. *Cōramañḍala*, from *Cōra*, or *Cōla*, name of a people + *mañḍala*, circle, kingdom). A vaguely defined region of British India, comprising the portion of the eastern coast of Madras lying between Point Calimere, in about latitude 10° 17' N., and the mouths of the Kistna, in about latitude 15° 40' N. (Map: India, D 6). The name is sometimes applied to the whole of the west shore of the Bay of Bengal. The coast has numerous inlets, but possesses no safe harbors. Ships are compelled to anchor several miles off the coast. The districts along the coast were the battlefields for supremacy in India between England and France in the eighteenth century.

COROMANDEL GOOSEBERRY. See **CARAMBOLA**.

COROMBO'NA, VITTORIA. The principal female character in Webster's play *The White Devil*, a beautiful woman whose unscrupulous acts, in part instigated by her brother, Flaminio, produce a series of crimes and murders.

CORONA (Lat., crown). In astronomy, the name given to the faint outermost luminous appendage of the sun, seen only during total solar eclipses, when the brilliant central disk is obscured. See **ECLIPSE**; **SUN**.

CORONÆ, in meteorology, are colored rings seen around the moon through peculiar forms of cloud. See **HALO**.

CORONA. In architecture, the most projecting upper part of the classical cornice: also used to designate the drip, or lower member of the cornice above the bed-molding and below the cymatium. (See **ENTABLATURE**.) The term corona is also applied, especially by ecclesiastical writers, to the apse or semicircular termination of the choir, as in the case of 'Becket's crown,' at Canterbury. Corona is also applied in ecclesiastical nomenclature to a chandelier, in the form of a crown or circlet, suspended from the roof of a church, or from the vaulting of the nave or chapels, to hold tapers which are lighted on solemn occasions. A famous mediæval example is at Saint Michael, Hildesheim.

CORONA. In plants, a word applied to any crown-like appendage at or near the summit of an organ. It is usually restricted, however, to appendages which occur in connection with corollas. For example, in the species of *Silene* and allied forms, members of the pink family, there is a two-lobed outgrowth at the junction of the claw and blade of each petal. Taking the petals together these outgrowths form a ten-lobed crown at the base of the blades. In the passion-flowers there is a very conspicuous corona consisting of many rows of filamentous outgrowths. Similar outgrowths are found in the flowers of other families, but are most notable in sympetalous corollas, where they form folds or projections in the throat, as in oleander, various borages, etc. In the several species of *Narcissus* the corona which rises from the throat of the corolla is often very conspicuous. In all cases these appendages are outgrowths from the inner face of the petals, and it has been suggested that they are the equivalents of similar outgrowths from the inner

face of grass-leaves, at the juncture of the blade and sheath. In this latter case the appendage is called a 'ligule.'



CORONA (p) OF NARCISSUS.

CORONA BO'REA' LIS (Lat., Northern Crown). A small and bright constellation near Hercules.

CORONACH, kōr'ō-nāk. See **CORANACH**.

CORONADO, kō'rō-nā'dō (Sp., crowned). The name among Spanish-speaking fishermen of the West Indies and Mexico for the amber-fishes of the genus *Seriola*. See **AMBER-FISH**.

CORONADO, FRANCISCO VASQUEZ (? - c.1549). A Spanish explorer. He came to the New World about 1535, and, by marrying Doña Beatriz, the daughter of Estrada, the royal treasurer for New Spain, secured preferment at the viceregal Court in Mexico. He was appointed Governor of the Province of New Galicia, and in 1539 secured the command of an expedition for the conquest of the 'Seven Cities of Cibola,' which the friar Marco de Niza claimed to have discovered on a preliminary expedition earlier in 1539. On February 23, 1540, Coronado started from Compostela with a large force of horsemen, infantry, and native allies, supplied with artillery and abundant munitions and food. He followed the western coast of Mexico till some distance beyond Guaymas, and then crossed the mountains into southeastern Arizona. On July 7 he reached and stormed the chief city of Cibola, the stone pueblo of Hawikuh, now represented by large ruins a short distance west of the pueblo of Zuni, in New Mexico. Making this his headquarters, Coronado sent expeditions to the West, which explored the country as far as the Moqui villages of Tusayan, and to the Grand Cañon of the Colorado, which was first seen by Europeans when the soldiers under Lopez de Cardenas reached it early in September, 1540. Other parties explored toward the east, and in September Coronado moved his forces to the Rio Grande, camping in the village of Tiguex, near Bernalillo, New Mexico. During the winter the natives of the river villages were subjugated after a fierce resistance. In April, 1541, Coronado led his whole army across the mountains into the great buffalo plains of Arkansas and Indian Territory. Finding that he was being misled by a native guide, he sent his foot soldiers back to the Rio Grande, while he, with thirty

horsemen, pushed northward, hoping to find a country rich in treasure. In July he reached a group of tepee villages, somewhere near the border line between Kansas and Nebraska. Convinced that the country contained nothing of value for him, although he recognized its splendid agricultural possibilities, Coronado returned to Tiguex. A severe fall from his horse induced Coronado to turn homeward in the spring. After several months of deprivation he reached Mexico with such of his army as had not deserted along the route. The viceroy received him coldly and allowed him to resign the government of New Galicia. Coronado is said to have lived quietly on his ample estates until his death, about 1549. The original documents describing Coronado's journey, which contain much information concerning the southwestern United States at the time it was first visited by Europeans, are translated in Winship, "The Coronado Expedition," in the *Fourteenth Report of the United States Bureau of Ethnology* (Washington, 1896).

CORONATION (from Lat. *coronare*, to crown, from *corona*, crown). The act or ceremony of crowning the sovereign of a monarchical country. The use of crowns in antiquity, as a mark either of honor or of rejoicing, will be explained under **CROWN**. It was, no doubt, as an adaptation of this general custom to a special use that the practice of placing a crown on the head of a monarch at the commencement of his reign was introduced. The practice is very ancient, as we may learn from the fact that Solomon and Ahaziah were crowned, and it has been followed in one form or another in most civilized monarchies. The ceremony is religious as well as political, and is usually performed by a high ecclesiastic, as a recognition that "the powers that be are ordained of God." Generally it has been accompanied by what was regarded as the still more solemn rite of anointing with oil, a ceremony which, from the time of the ancient Hebrews to our own, has been peculiarly significant of consecration or devotion to the service of God. The term employed for 'crowned' in the Saxon chronicle is 'gehalgod,' hallowed or consecrated; and it would seem that the ceremony as then performed at Kingston-on-Thames or Winchester was in all essentials the same as that which now takes place in Westminster Abbey.

Coronation in the early days of the European monarchies was an indispensable rite, without which no accession to a throne would be recognized by the people; but in our day, the line of succession being clearly established, the ceremony is often deferred without prejudice to the loyalty of the subject.

As a generally indispensable preliminary to coronation, a solemn pledge is in most countries exacted from the new sovereign, called the coronation oath. There are very early traces of this, both among the Jews and among the rulers who established themselves upon the ruins of the Roman Empire. Before the principle of hereditary succession was firmly established, the consent of the people was an important factor in a transfer of sovereignty, and was purchased by this solemn undertaking to rule justly and to preserve every man's rights. The English coronation oath, as at present existing, is the most definite and carefully considered agreement

of the kind. After the Revolution of 1688 it was made more explicit than ever, including an express engagement on the part of the sovereign to maintain "the laws of God, the true profession of the Gospel, and the Protestant reformed religion as it is established by law." The oaths of other countries are less elaborate and specific than that of England.

For a learned treatment of coronation usages in general, as well as of a typical modern instance, consult Pascoe, *The Pageant and Ceremony of the Coronation of their Majesties King Edward the Seventh and Queen Alexandra* (New York, 1902).

CORONATION, THE. A play licensed by Shirley in 1635. It was, however, wrongly included in the earlier editions of Beaumont and Fletcher, as theirs.

CORONATION CHAIR. The ancient throne used at the coronation of English kings since Edward I. It is kept in a fair state of preservation in Westminster Abbey. Beneath the seat rests the famous Lia Fail, the Stone of Destiny, on which Scottish kings were crowned. The stone is said to be the one used by Jacob as a pillow, and to have been taken to Tara in Ireland in the fifth century B.C., whence it was brought to Scotland and removed to England by Edward I.

CORONATION GULF. An inlet of the Arctic Ocean, penetrating the continent of North America, north of the Arctic Circle, and included between longitudes 107° and 116° W., Bathurst Inlet being an extension toward the southeast. It is connected with other Arctic channels by Dease Strait on the northeast and Dolphin and Union Strait on the northwest (Map: North America, II 3). It is studded with islands and receives the waters of the Coppermine River from the south.

CORONATION OATH. See **CORONATION**.

CORONEL, kō'rō-nēl' (Sp., from Lat. *coronalis*, pertaining to a crown, from *corona*, crown). A port in the Province of Concepción, Chile, situated on the Bay of Arauco (Map: Chile, C 11). It is the commercial centre for the highly productive coal-mining district in the vicinity, and is a coaling station. It is the residence of a United States consular agent. Population, in 1895, 2292.

CORONELLI, kō'rō-nēl'le, MARCO VINCENZO (1650-1718). An Italian geographer, born in Venice. He became a monk and devoted himself to cosmography in Venice. He then went to Paris, where he was commissioned by Louis XIV. to construct two large globes four meters in diameter, which are in the Bibliothèque Nationale in Paris. They are considered among the greatest curiosities of the science of the seventeenth century. In 1685 Coronelli returned to Venice, was made geographer of the Republic in 1702, and in that capacity published a number of maps and histories. His works include: *Isola di Rodi, geografica, storica, antica e moderna* (1685-1702); *Memorie istorico-geografiche del regno della Morea* (1685).

CORONER. A very ancient and important county officer in England, Ireland, and Wales, whose original duty appears to have been that of keeping, as distinguished from holding, the pleas of the Crown: for coroners are designated in the earliest charters alluding to the office as

custodes placitorum coronæ and *coronatores*. The exact date of origin of the office is not known, but the better modern view is that it was at least firmly established under Henry II. in the twelfth century. From England the office of coroner has arisen in the United States and in the English colonies.

The chief duty of the coroner is that which is described by Lord Chancellor Campbell when he says: "The coroner, next to the sheriff, is the most important civil officer in the county, and he performs the duty of the sheriff when the sheriff is disabled from doing so; and there are peculiar duties prescribed to him, more particularly to inquire into the manner in which persons have come to their deaths where there is any reason to suppose that it may not have been by natural means; and, on the inquiry, the jury being sworn, the jury have all the rights of a grand jury to find a verdict of murder, and on that finding the accused may be tried and may be sentenced to death." The coroner's duties in respect to this inquiry as to suspicious deaths has hardly varied at all from the fourteenth century to the present time, except as regards the methods of procedure, such as summoning jurors, witnesses, etc.

Besides his duty to inquire into causes of suspicious deaths, his other peculiar duties included that of inquiring concerning treasure trove—who were the finders, and where the treasure is, or whether any one be suspected of having found it and concealed it—and, formerly, the duty of inquiring concerning shipwrecks, and certifying whether it was a wreck or not (see WRECK); of holding inquests on royal fish; inquiring into the goods of felons; and the holding of inquests on certain felonies, such as the breaking of a house and the sudden injury of a person under suspicious circumstances. Until 1888, in England, the coroners were chosen by the freeholders at a county court held for the purpose, but by the Local Government Act the county council were made the electors. The coroner is also *ex officio* a conservator of the King's peace (see CONSERVATOR OF THE PEACE), and in this capacity may act as a magistrate; his ministerial office is exercised only when he acts in place of the sheriff.

In the United States and in some of the colonies of Great Britain, the duties and powers of coroners have been enlarged, or restricted, and in some cases the office has been entirely abolished. The coroner is vested by statute in some jurisdictions with the power and duty to investigate into the causes and origins of fires which appear to be of incendiary origin or of such a nature as to require investigation; but *ex officio* the coroner has no authority to inquire into the cause or origin of a fire except when death has resulted from it.

For a fuller description of the manner of choosing coroners and of their duties and powers, the statutes of the jurisdiction must be consulted.

Consult: *Encyclopædia of the Laws of England*, vol. iii. (London, 1897); Binmore, *Instructions for Sheriffs, Coroners, and Constables* (2d ed., Chicago, 1894); Borden D. Smith, *Powers, Duties, and Liabilities of Sheriffs, Coroners, and Constables* (2d ed., Albany, 1897); Jarvis, *Office and Duties of Coroners, with Forms and Precedents* (5th ed., London, 1888); Stephen, *History of the Criminal Law* (London,

1883); Pollock and Maitland, *History of English Law* (2d ed., London and Boston, 1899); Boys, *Treatise on Coroners* (Toronto, 1893).

CORONET. A special crown worn by princes and nobles on state occasions, and always represented above their coats of arms. Coronets were apparently intended originally as fillets to confine the hair, and during the reign of Edward III., when they were not yet used as distinctions of rank, were ornamented with leaves. Later they came to be recognized as distinctions of nobility, but were assumed arbitrarily without royal warrant or restriction as to use. In more modern times they have been strictly regulated, especially in England. The following rules apply to that country: The coronet of the Prince of Wales differs from the crown of England only by having a single instead of a double arch; a duke's coronet has on the rim eight strawberry-leaves of equal height; that of a marquis four strawberry-leaves and four pearls or balls of silver, alternately; that of an earl, eight pearls set on lofty spikes, alternating with strawberry-leaves set lower; that of a viscount has fourteen or sixteen pearls close together; that of a baron, six pearls. The privilege of wearing coronets was first granted to viscounts by James I., and to barons by Charles II. The French rules are substantially the same.

CORONINI-CRONBERG, kō'rō-nē'né-krōn' bĕrk, FRANZ, Count von (1833—). An Austrian statesman, son of the following, and one of the early companions and schoolmates of Emperor Francis Joseph. After studying philosophy and law, he served in the campaigns of 1859, 1864, and 1866, and was promoted to the rank of colonel in recognition of his distinguished services at the battle of Königgrätz. He was president of the Chamber of Deputies from 1879 to 1881, and in 1882 founded the Coronini Club. He became a member of the Upper House in 1897.

CORONINI-CRONBERG, JOHANN BAPTIST ALEXIUS, Count von (1794-1880). An Austrian general, father of the foregoing, born at Grz. He entered the army in 1813, and participated in the campaigns of 1813 and 1814. After serving for several years in Italy, he was in 1836 appointed chamberlain of the Archduke Francis Charles, in which capacity he became preceptor of the Emperor Francis Joseph. As major-general he defended the passes of the Tyrol against the Italians in 1848, and by reason of the energy and skill displayed on that occasion he was selected for a somewhat similar task during the Crimean War (1854), being intrusted with the chief command of the army of occupation in Wallachia. He was commanding general in Upper and Lower Austria, Salzburg and Styria in 1860, and in 1861 was appointed to the same position in Hungary.

COROT, kō'tō', JEAN BAPTISTE CAMILLE (1796-1875). A French landscape painter, born in Paris, July 29, 1796. His father was a hairdresser who married a milliner, and by shrewd management of her business gained a competence. Camille was educated in the college in Rouen, his father's home, and on his return to Paris he was apprenticed to a draper, in accordance with his father's wishes. But trade had no charms for him, and in the meanwhile he had acquired a taste for painting. After seven years of apprenticeship with the draper, he

resolved to be a painter. His father made him an allowance, upon which Camille managed to subsist until financial success crowned his efforts. He first studied with Michallon, and upon the latter's death with Victor Bertin, a classicist and an apostle of the historical landscape. The years 1825 to 1827 he spent in Italy, and in the latter year he made his debut at the Salon with two Italian landscapes—a "View of Narai" and the "Campagna at Rome." He again went to Italy in 1834 and in 1842, besides traveling in France, Switzerland, the Netherlands, and England. But the greater part of his life was passed in Paris and Ville d'Avray, in the forest of Fontainebleau and the valley of the Seine. In these places he found subjects for his most beautiful pictures.

It was some time before his works were recognized, but in his later life honors were heaped upon him. He received medals in 1833, 1855, and 1857; in 1846 he received the Cross of the Legion of Honor, and in 1857 he was made a commander. The younger artists almost worshiped him, and in 1874 his friends gave him a gold medal to atone for the neglect of the Salon. Dealers sought his pictures, and it is said that in the time of his prosperity his income from sales alone amounted to 200,000 francs a year. But Corot never cared for money except to help his friends, which he did with a lavish hand. He was gentle, jovial, and kind, and the figure of Père Corot, in his blue blouse and woolen cap, with his long white hair and the inevitable pipe, brought joy and sunshine. He never married, but was devotedly attached to his sister and his mother. He died in Paris on February 22, 1875.

Corot's art naturally falls into two periods, divided from each other by about the year 1843. During the first of these he painted like the contemporary classicists, very detailed, with careful and severe drawing, but not without a certain charm of color. The influence of this classical training may be seen in the nymphs with which he loved to people his landscapes, and the absolute mastery over technique which we see in his second period. This may be said to have begun with his return from Italy in 1843, when he adopted the method of painting in the open air, which had been introduced from England by Constable and others. The works of this second period are the works from which we chiefly know him and which made him famous.

Corot was the great lyric poet of the Barbizon School, as Rousseau was the epic, and Duprè the dramatic. As Rousseau portrayed the strong and vivid side of nature—the oak, of all the trees, the plains, the hills, the river, and the forest—so Corot painted the tender, the wavering, the feminine side—the poplar, the birch, the willow, the wild flowers, sweet and shrinking. He was a painter of the misty morning and of the shadowy evening, of the hazy springtime. A light mist or a haze of atmosphere usually envelops his pictures. As with Rousseau drawing was the most important feature, so with Corot it was color. His pictures are always in a low key: browns, pale greens, and silvery grays are among his favorite colors, but in this sad setting the occasional touches of bright color appear all the more effective. The values of his colors are perfect, and above all each picture is an expression of deep sentiment—"the confession of a beautiful soul." His works have well been called painted

music, and it is no accident that he was himself a gifted musician.

His landscapes have often been criticised because of their similarity, but they are only similar in theme; the treatment is infinitely varied. It has also been urged that his works are too even; that they do not contain certain acid tones and little defects which are found in nature and add to the effect of the picture. Such blemishes might indeed have made his work more realistic, but they would not have harmonized with the softness and delicacy of effect, which it was his chief effort to obtain. As regards the figures which usually form a part of his picture, whether they be nymphs and goddesses or French peasants, they rather heighten the effect of the landscape than otherwise, and with it they are always in perfect harmony. So great was his technical ability and so vivid his imagination, that his usual method was to paint his works in his studio from sketches and notes taken from nature.

Corot has left a large number of works on a great variety of subjects. During his early period he painted many Italian landscapes, and even religious subjects. Of these landscapes there are two good examples which he himself bequeathed to the Museum of the Luxembourg, Paris, viz. the "Roman Forum" and "The Coliseum." Of his religious pictures the "Baptism of Christ," in the Church of Saint Nicolas du Chardonnet in Paris, is a good specimen. The landscapes of his later period are incomparably his best works. Among the best known is the "Dance of the Nymphs," in the Luxembourg Gallery, a fresh morning scene of a peculiar blue tone, and the incomparable "Paysage," in the same collection, showing his marvelous treatment of a lake with overhanging foliage. There are many other good examples in the museums and private collections of France, and not a few in America. The Metropolitan Museum in New York possesses in the "Ville d'Avray" a fine specimen of Corot's dainty treatment of water, foliage, and distant buildings in the early morning light. The faint rose of the sky suggests the coming dawn, and the touches of yellow and blue in the garb of the woman lend a soft brightness to the scene. There are other good examples in the Corcoran Gallery at Washington, in the Art Institute of Chicago, and in the private collections of Philadelphia. But not until the centenary exhibition in Paris in 1889 did men know what modern art possessed in Corot—"the greatest poet and the tenderest soul of the nineteenth century."

Consult: Muther, *History of Modern Art* (London, 1896); Stranahan, *History of French Painting* (New York, 1899); Robinson, "Th. Corot," in Van Dyke's *Modern French Masters* (New York, 1896); Blane, *Les artistes de mon temps* (Paris, 1879); Roger-Milès, "Corot," in *Les artistes célèbres* (Paris, 1891); Rousseau, *Camille Corot* (Paris, 1884).

CORPORAL (Fr. *caporal*. It. *caporale*, corporal, from *capo*, head, from Lat. *caput*, head; influenced by popular etymology with *corporal*, bodily, or *corps*, body of troops). A military title of similar relative non-commissioned rank throughout the armies of the world. In the United States it is the lowest non-commissioned rank. It may be preceded by the appointment

of lance corporal, given to private soldiers desirous of and selected for promotion.

CORPORAL (Lat. *corporale*, from *corpus*, body, because the host or sacramental body of Christ rests upon it). A square linen cloth which is spread upon the altar during the mass, and upon which rest the chalice and paten. It was originally large enough to be folded over the oblations of the people when they were placed upon the altar. Even after this custom ceased, one fold of it was still turned over the chalice, but this was later made a separate piece, now known as the pall (q.v.). The older usage was long preserved in the French Church and in the Carthusian Order. Both corporal and pall must be blessed by the bishop, and when not in use are carried in the burse, a square pocket of cardboard covered with silk, none except those in holy orders being allowed to touch them.

CORPORAL, THE LITTLE (Fr., *Le petit corporal*). A term of familiarity and affection applied by the French soldiery to Napoleon I., who began his military career as a *sous-lieutenant* in Corsica.

CORPORAL PUNISHMENT. Punishment by the infliction of pain or hardship upon the body, as by confinement in the stocks, branding, or flogging. Ordinarily the term is understood to refer only to flogging or whipping of the body.

Much has been said for and against this last kind of punishment, both as a means of public and private correction. The contention of those who oppose its use and deny its value is that it degrades the one punished and the one who executes the punishment, and that it tends to deteriorate the character of the person punished by taking away his self-respect. Those who favor it generally admit that severe floggings which lacerate the body or which are so contrived as to cause extreme agony, as in the bastinado, do cause a degeneration in the moral character of the victim which increases his tendency to repeat his offense or commit others in spite of the danger of the second punishment, and that this is especially the case when such punishment is inflicted publicly. But they claim, with apparent truth, that whipping which produces stinging but transient pain, without mangling the body and without such public disgrace as to destroy the sense of shame, is an efficient corrective for those cruel, or brutal, or intractable offenders, such as wife and child beaters, who are insensible to the punishment of confinement or other ordinary penalties which are far more protracted and of much greater expense to the State. In such cases a smart whipping, not brutally inflicted, seems to exercise a control over the offender, without the long confinement which often necessarily removes from a dependent family its only means of support. Corporal punishment at the hands of public officers as a punishment for crime is usually inflicted by flogging in prison or at the public whipping-post. Further information will be given under the titles FLOGGING; WHIPPING.

The authority of the husband, parent, guardian, and schoolmaster to inflict corporal punishment upon the wife, child, or pupil will be considered under the titles HUSBAND AND WIFE; GUARDIAN; WARD; PARENT AND CHILD; SCHOOLMASTER, etc. See also the article APPRENTICE. For a bibliography of corporal punishment as a

punishment for crime, consult the authorities referred to under the titles PENOLOGY; CRIMINOLOGY.

CORPORAL TRIM. An old soldier, the servant of Uncle Toby in Sterne's *Tristram Shandy*.

CORPORAL VIOLET, or FATHER VIOLET. A name given to Napoleon Bonaparte by his adherents in France when he was in exile. The violet typified the Empire, which, in the person of Corporal Violet, it was predicted, would return in the spring.

CORPORATION (Lat. *corporatio*, from *corporare*, to embody, from *corpus*, body; the classical terms were *corpus*, *universitas*, *collegium*).

Roman and Civil Law.—The legal conception of the corporation was clearly worked out at Roman law. As a ship remains the same ship, although all its parts be gradually renewed by successive repairs: as a human body remains the same body, although waste and repair periodically change all its minutest particles; so a body of human beings, like a bench of judges, a legion, or the Roman people, remains the same body in spite of all changes in its composition (Afenus, in Digest, 5, 1, 76). In all cases in which such a body of persons is recognized as a separate legal entity—in all cases, that is, in which the body itself is regarded as owning property, holding claims, and owing debts—a *corpus* or *universitas* exists; where, on the other hand, the members of an association are treated as joint proprietors, joint creditors, and joint debtors, all that exists is a *societas* or partnership.

The Roman law recognized both *private* and *public* corporations. Private corporations (at least in the Imperial period) could not be established except by special authorization or under certain general statutes. In the field of public law, the towns (*municipia*), or, rather, the town councils (*collegia decurionum*), were regarded as corporations; and the Imperial treasury (*fiscus*) was recognized as an entity distinct from the Empire. From this latter theory was derived the valuable conclusion that the *fiscus* could be sued by private persons to recover property or enforce contractual claims. Charitable corporations were recognized; when the Empire became Christian, churches and monasteries received the rights of corporations; but where property was devoted to a permanent charitable use (*pia causa*) it was not necessary to give it to an existing charitable corporation nor to create a new corporation to hold it. The Roman law did not treat the persons who administered such property as titular owners subject to a trust, nor was it usual, as at English law, to incorporate boards of managers and to treat the corporations thus created as owners of the property. The Roman law, in its final development, treated the foundation itself as a legal entity, and viewed the persons who managed the property as mere officers and representatives of the foundation.

Modern civil law uses these Roman conceptions without substantial change. The German jurist Gierke, indeed, maintains that mediæval German law developed, and modern jurisprudence is bound to recognize, a third type of association, intermediate between corporation and partnership, which he terms the *fellowship* (*Genossenschaft*): but his theory has obtained no legislative or judicial recognition. The German civil

code (1896) declares that "societies which are not incorporated are governed by the rules relating to partnership."

As regards the theory of the 'juristic person,' modern civilians generally regard corporations and foundations as persons only by virtue of a legal fiction. This legal fiction is generally regarded as useful and indeed necessary; but a few writers regard it as unnecessary and harmful. These assert that a corporation is nothing but a plurality of natural persons acting under special rules as regards presentation (i.e. agency) and governed by special rules as regards succession; and they assert that harm is done by obscuring the fact that the private corporation is simply a particular method in which natural persons hold property and do business. Still another school maintains that permanent associations, public and private, have a character and a will which are not the sum or the resultant of the characters and wills of the individuals who compose them; and that such associations have thus a true personality which the law does not create, but merely recognizes. This is sometimes described as the anthropomorphic theory.

English Common Law.—Three distinct factors are to be recognized as essential to the existence of a corporation: (1) One or more natural persons, who are the incorporators, or so-called members; (2) one or more trustees, managers, or directors, who have the general control of its affairs, and may or may not include all, and be coincident with, the incorporators; and (3) the corporation, or artificial person, created by the fiat of the law, and always separate and distinct from both its members and its trustees or managers. It is this separate existence, as a legal entity, which distinguishes it from a partnership and from a joint-stock company.

Classification.—Corporations are classified as to either the number of members, or the objects for which they are formed, or the fullness and completeness of their powers. With regard to the number of members, they are either *aggregate* or *sole*. An aggregate corporation has more members than one, and is the more common form. A sole corporation consists of a single member and his successors, who are by law invested with the same capacities as an aggregate corporation. Thus the King of England, or a bishop, is a sole corporation. A very few sole corporations exist in the United States. In New York, for example, a joint-stock company composed of seven or more members may sue and be sued in the name of its president, and the president is for this purpose a sole corporation.

With respect to the purposes of their existence, corporations are classified as *ecclesiastical* and *lay*, and the lay are subdivided into *civil* and *eleemosynary*. Ecclesiastical corporations are concerned wholly with religious matters, including the management of ecclesiastical property, and are composed wholly of spiritual persons, as distinguished from laymen. There are none such, properly so-called, in the United States. An eleemosynary corporation is one formed for purposes of charity, in the legal sense of that word, i.e., general public benefit and utility. Examples are found in schools, colleges, and hospitals. *Civil corporations* are those that are formed for temporal purposes. They are either (1) *public*, or *municipal*, i.e. created for

governmental purposes, such as cities and villages; or (2) *private*, including others of a civil nature, such as railroad companies and manufacturing and general business corporations. Since municipal corporations are part of the machinery of government, they may be dissolved, restricted, or modified at the will of the legislature; but an act which creates a private corporation has in the United States been deemed to be in the nature of a contract, and (because of that provision of the United States Constitution which forbids the States to pass any laws impairing the obligation of contracts) cannot be repealed or materially altered or impaired against the will of the corporation. The operation of this rule is obviated in some States by constitutional provisions, or by special clauses in the acts creating corporations, to the effect that the legislature shall have power to abrogate or modify such acts. The divisions of corporations with reference to their powers is into *complete* and *quasi*. Those are *quasi* which possess some, but not all, of the ordinary powers of a corporation. Counties, school districts, and in some States, as New York, towns, afford examples of *quasi* corporations.

The methods of creating corporations are by charter or letters patent from the Crown, by legislative act, and by prescription. Some corporations which trace their origin to royal charter exist in the United States; while others may be found which derive their franchise from immemorial usage or prescription; but the most common mode of forming them is by act of the legislature. This latter method is either by special act or charter, or by a general law which enables persons so desiring, by conforming to prescribed conditions and formalities, to become *ipso facto* a corporation. The formation under a general law is most favored, and is made mandatory by the Constitution of some of the States.

Corporate Powers.—The powers of a corporation are those given by its charter, or the general law under which it is organized, or fixed and determined by usage when it exists by prescription, together with those which are implied by law as reasonably necessary or proper to enable it to exercise its express powers, and to realize the objects for which it exists. They include the power to make contracts; to sue and be sued; to hold property; to have a corporate seal; to make by-laws; and to elect and remove members and officers. If it exceed its proper functions, it is said to act *ultra vires*. A contract *ultra vires* is, according to the weight of authority, void; but money paid, or the value of property given, to a corporation under an *ultra vires* contract may be recovered under theory of quasi contract (q.v.). In a few jurisdictions, New York, for example, if the person dealing with a corporation has performed on his part an *ultra vires* contract, the corporation is held to be estopped from setting up its want of power. (See ESTOPPEL.) Corporations have been held liable for torts resulting from their negligent performance of an act, whether authorized or unauthorized, and it is now generally held that a corporation may be liable for any tort, the malice or negligence of the agent being imputed to the corporation. It was formerly held that a corporation could legally perform no act except under its corporate seal; but it may now act without a seal where natural persons may do so. The quantity of land which a corporation may

hold is usually fixed by its charter, or a general law, and is commonly restricted in this country to so much as is necessary for the proper conducting of its business. A corporation has never been held liable for a crime, except in cases where injury has resulted from its neglect of a duty required of it by law, or for nuisance.

Public Control of Corporations.—The right of *visiting* a corporation, conferred by charter or legislative appointment, is that of exercising legal superintendence and control over its actions. It is an absolute, summary power which is not reviewable by the courts, unless its arbitrary exercise would result in gross injustice. It is strictly applicable only to ecclesiastical and eleemosynary corporations; the visitor of the former being the bishop of the diocese, and of the latter, the founder and his heirs, or persons appointed by the founder. In the United States the visitors of charitable corporations are usually their trustees, the right of visitation being determined wholly by statute. Civil corporations are subject to the general law, and are amenable to the process of the courts; and for misuse of powers or flagrant wrongs may be dissolved by proceedings instituted in behalf of the State.

A corporation may be dissolved by legislative act; by judicial decree; by surrender of its franchise and acceptance of the same by the State; or by the death of so many members that enough are not left to elect new members pursuant to its charter. The power to dissolve by legislative act is unlimited in England, but in the United States it is restricted as pointed out above. A judicial decree dissolves for the violation of the conditions of the charter or the law under which it exists. Upon dissolution, the property of the corporation becomes a trust fund for the benefit of the State or the stockholders, usually the latter. If the institution were charitable, this fund is administered by new trustees appointed by the court.

Strictly, a corporation can have no legal existence outside the jurisdiction of the sovereignty under which it was created. By a legal fiction, however, a corporation is held to exist legally whenever it is doing business, and it may sue and be sued, acquire property, etc., outside of the State of its creation.

Citizenship of a Corporation.—Under the Constitution of the United States, a corporation is deemed not to be a citizen of a State, so that it cannot as a foreign corporation claim equal protection of the law with the citizen of a State other than the State of its creation. It follows that a State may impose any terms as a condition of a foreign corporation doing business within the State, provided it does not interfere with the corporation's constitutional right to carry on interstate commerce. A corporation, however, is a citizen within the meaning of the clause of the Constitution conferring jurisdiction on the Federal courts, and it may sue or be sued in the Federal courts, and may in a proper case remove a cause from a State to a Federal court. Consult: Angell and Ames, *Treatise on the Law of Private Corporations* (Boston, 1882); Cook, *Treatise on the Law of Corporations Having a Capital Stock* (Chicago, 1898); Thompson, *Commentaries on the Law of Corporations* (San Francisco, 1895-99); Clark and Marshall, *Treatise on the Law of Private Corporations* (St. Paul, 1901). See CHARTER; CERTIFICATE;

DARTMOUTH COLLEGE CASE; CONTRACT; CITIZEN, etc. For a discussion of municipal corporations, see the article on MUNICIPAL CORPORATIONS and its bibliography; and for the treatment of the subject of corporations in its relation to civil and Roman law, see article on CIVIL LAW. Consult also such general treatises as those of Kent and Blackstone.

CORPS, kōr (Fr. *corps*). A military term denoting a body of officers, or officers and men, generally a distinct military organization, as the signal corps, corps of engineers, and the various battalions of volunteers throughout England, locally known as the volunteer corps. More specifically it applies to the corps d'armée, or army corps, which, in the United States, consists normally of about 25,000 men, divided into three divisions, each of three brigades of three regiments of infantry, with cavalry and artillery in proportion, commanded by a major-general. European armies generally are similarly organized, with army corps of varying strength and composition. (See ARMY ORGANIZATION.) In the navy, it is used in both senses, as the *medical corps*, the *pay corps*, the *marine corps*, etc.

CORPS DIPLOMATIQUE, kōr dē'plō'ma'tēk' (Fr., diplomatic body). The entire body of foreign ambassadors and diplomatists assembled at the Court, or the capital, of a country.

CORPSE (OF., Fr. *corps*, body, from Lat. *corpus*, body). A dead human body is not property in the ordinary commercial sense of the term. In the absence of a statute authorizing it, a contract for the sale of such a body is void, as tending to outrage decency, humanity, and sound public policy; and an officer who seizes or holds the body under any legal process issued against the person while living is guilty of a criminal offense. But while a dead body is not property, it is the object of certain well-defined rights. The possessor of these rights is the surviving husband or wife, or the nearest of kin of the deceased, unless the deceased has made a valid disposition of his body by will. Accordingly, if one mutilates a dead body, or prevents its burial, or unlawfully interferes with it after burial, he may not only be punishable criminally, but be liable in an action for damages to the husband, or wife, or next of kin, of the deceased.

Controversies between persons as to the place of burial of a dead body, or as to its proper treatment, are within the jurisdiction of a court of equity in the United States, and are not subject to ecclesiastical decision—as has from an early period been the case in England. This is upon the theory that the rights in a dead body are in the nature of a sacred trust, in the proper performance of which all are interested who were allied to the deceased by family ties.

Not only is a dead human body the object of legal rights, but it is also the object of legal duties on the part of the living. The husband, or the wife, or the nearest of kin, or in the absence or poverty of these a stranger under whose roof a death occurs, is bound to give the body of the deceased a decent burial. Any one who casts it away without funeral rites, or indecently exposes it, is liable to criminal punishment. On the other hand, the expenses of a proper burial have priority over every other claim against the estate of the deceased. Con-

sult the authorities referred to under *SALE* (of *personal property*): *BURIAL*, etc.

CORPS LÉGISLATIF, kōr' lā'zhé'slā'téf' (Fr., legislative body). The name of the Lower House of the French national legislature from 1852 to 1870. The number of members was 251, elected by universal suffrage for a term of six years. They were largely the creatures of Napoleon III. Consult the histories of the period by Granier de Cassagnac, Taxile Delord, Beaumont-Vassy, and De la Gorce. See *FRANCE*; *NAPOLEON III*.

CORPS (kōr) OF ARTILLERY. See *ARMY ORGANIZATION*; *ARTILLERY CORPS*; and *UNITED STATES*, section on *Army*.

CORPS OF ENGINEERS. See *ENGINEERING, MILITARY*; *ARMY ORGANIZATION*; and *UNITED STATES*, section on *Army*.

CORPUS CATHOLICO'RUM, and **CORPUS EVANGELICO'RUM** (Lat., body of Catholics, and body of Evangelicals). The names given in Germany after the Peace of Westphalia (q.v.) to the Roman Catholic and Protestant divisions of the Empire respectively. The Elector of Mainz was at the head of the former as president. It generally held its meetings in a convent of that city in which the Diet happened to meet. The elector of Saxony was at the head of the latter. When the Electoral House of Saxony became Roman Catholic, the control was given to the Privy Council, which was a Protestant body. Both were extinguished by the dissolution of the German Empire in 1806.

CORPUS CHRISTI (Lat., body of Christ). An important festival of the Roman Catholic Church, in honor of the sacrament of the Eucharist. It was instituted in 1264 by Urban IV., partly in consequence of the vision of a Flemish nun named Juliana, and partly because the anniversary of the sacrament's institution fell at the most solemn and mournful time of the Christian year, when services of a festal character were impossible. It was assigned to the Thursday after Trinity Sunday, and this day is still observed in most parts of Continental Europe by magnificent processions through streets decked with flowers and green boughs. In Vienna the Emperor of Austria walks every year immediately before the Archbishop carrying the Host. The office of Corpus Christi, composed by Saint Thomas Aquinas, is one of the most beautiful in the breviary.

CORPUS CHRISTI. A city and county-seat of Nueces County, Tex., 178 miles south by east of Austin; on Corpus Christi Bay, and on the Mexican National and the San Antonio and Aransas Pass railroads (Map: Texas, F 6). It is the centre of a market-gardening section, has a canning factory, and exports fish and oysters. There is a good harbor, attracting considerable coasting trade. Settled in 1849, Corpus Christi was incorporated in 1876, and is governed under the charter of that date by a mayor, elected every two years, and a city council. Population, in 1890, 4387; in 1900, 4703.

CORPUS CHRISTI COLLEGE (Cambridge). In 1352 the two guilds of Corpus Christi and Saint Mary in the town of Cambridge united to found a hall or college for educating clergy to fill the places of those carried away by the recent visitation of the black death. The master and two fellows of this new founda-

tion served as chaplains of the guild, and officiated also in Saint Benet's Church, at which the members of the fellowship of Corpus Christi worshiped, and which was impropriated to the college. For this reason, the college was earlier known as Saint Benet's. In the sixteenth century the patronage of Sir Nicholas Bacon, who was a member and a benefactor of the college, together with the mastership of Archbishop Parker, brought the foundation much profit and honor. In particular, the unrivaled collection of manuscripts, collected by the latter at the dissolution of the monasteries and bequeathed to the college, are among its chief treasures. Besides this and the Lewis collection of printed books, the college owns the most interesting collection of plate in the university. Christopher Marlowe and John Fletcher were members of Corpus Christi, as was Archbishop Tenison. The buildings are of much interest, including, as they do, the earliest closed quadrangle in the university, standing almost unaltered since its erection in the fourteenth century. The college consists of a master, twelve fellows, and twenty-six scholars, besides undergraduates.

CORPUS CHRISTI COLLEGE (Oxford). One of the smaller colleges in the university. It was the first of the Renaissance foundations, and its establishment marks an epoch in the intellectual history of the university. It was founded in 1516 by Richard Fox, Bishop of Winchester, and Lord Privy Seal, the principal Secretary of State and chief counselor and diplomat of Henry VII., partly at the suggestion and cost of Oldham, Bishop of Exeter. In Corpus Christi College we find the first noteworthy attempt to depart from the older educational tradition of the university, in the establishment of an endowed chair of Greek, the first in Oxford, and in throwing open the professorial lectures to all members of the university. The honor of founding the professorial system Fox shares with Bishop Waynflete and Margaret of Richmond, whose executor he was. The statutes of his foundation contain the most stringent rules for life and work, quaintly worded in the form of an allegory of a hive of bees. These, with the liberal provisions for the study of Latin and Greek, and humanistic studies in general, called forth the high praise of Erasmus. Though his prediction of the future preëminence of the college in the university has not been fulfilled, Corpus Christi has always maintained an excellent reputation for scholarship. It has counted among its members, John Keble, Thomas Arnold, 'the judicious Hooker,' his patron Bishop Jewell, Nicholas Udall, the author of the first English comedy, and, for a very brief period, Oglethorpe, the founder of Georgia, Chief Justice Coleridge, and Thomas Day, author of *Sandford and Merton*. The buildings of the college, though of several periods, are among the most harmonious in Oxford, and in this, as in its size, character, and standing, it has been aptly reckoned among the three typical colleges of the university. Its statutes were revised in 1881, and the new provisions are not as yet fully carried out. It consists on its present foundation of a president, thirteen ordinary and two professorial fellows, twenty-eight scholars, and seven exhibitioners, besides undergraduates.

CORPUSCULAR THEORY OF LIGHT. See *LIGHT*.

CORPUS DELICTI (Lat., body of the offense). In criminal law, the essential element of the alleged crime. If a person is charged with murder, the prosecution must prove the death, as by the finding and identification of the corpse, or by evidence of criminal violence adequate to produce death and to account for the disappearance of the body. In other words, the *corpus delicti* in such a case consists in the death of the person alleged to have been murdered, and the criminal agency of the alleged murderer in producing that death. The same doctrine is applicable to other offenses. If one is charged with larceny, the prosecution must prove that the crime of larceny has been actually committed. See **CRIMINAL LAW**, and consult the authorities there referred to.

CORPUS DOCTRINÆ (Lat., body of doctrine). A collection of writings intended to have authority in the Protestant churches of Germany. The chief of such collections was the *Corpus Philippicum* (Leipzig, 1560), containing the Apostolic, the Nicæan, and the Athanasian Creeds, the Augsburg Confession, and Melancthon's *Loci Communes*. This and similar collections were superseded by the *Formula Concordiæ*. See **CONCORD, BOOK OF**.

CORPUS INSCRIPTIÖNUM LATINARUM (Lat., body of Latin inscriptions). A great collection of Latin inscriptions, geographically arranged in fifteen volumes, published by the Royal Academy in Berlin. The first volume appeared in 1863. This work is the most important authority in the study of epigraphy.

CORPUS JURIS (Lat., body of law). A comprehensive collection of the entire body of law of a given jurisdiction. The phrase has been specifically applied to two great compilations of law, both based on the jurisprudence of the Roman Empire, viz.:

(1) The *Corpus Juris Civilis*, or body of the civil law known, by way of eminence, as the *Corpus Juris*, is made up of the Code, the Pandects, or Digest, and the Institutes, compiled and promulgated by the authority of Justinian (A.D. 528-534), and the Novels (*Novellæ Constitutiones*), subsequently promulgated by him to correct errors and defects in the previous work. The first instance of the use of the expression *Corpus Juris Civilis* to describe the collection is found in the year 1583. As a whole the work became the text-book of mediæval law, was the basis of instruction in the great law schools of Bologna and elsewhere, and is the foundation of the scientific study of law in all the universities of Continental Europe to-day. It has been truthfully said that "with the exception of the Bible, no book was ever more widely studied by the Caucasian races." The best edition is that of Mommsen (who edited the Digest), Krüger (Institutes and Code), and Schæel (the Novels). It has been translated into German, but never as a whole into English, though the Institutes and some portions of the Digest have been made available for English readers. See **CIVIL LAW; CODE; DIGEST**; and consult Lee, *Historical Jurisprudence* (New York, 1900); and Hadley, *Roman Law*.

(2) *Corpus Juris Canonici*.—The corresponding body of the canon law of the Church of Rome had a slower growth. The first compilation to which the name was applied was the *Decretum*

of Gratian, a learned professor of the canon law at the University of Bologna, published about A.D. 1150. This was a private, unofficial collection of synodical canons and Papal decretals, made for use as a text-book in the law school, but it at once became a leading authority in the Church. Subsequent official collections—principally the *Libri Extra Decretum* of Pope Gregory IX., the *Liber Scetus* of Boniface VIII., and the compilation of Clement V., known as the "Clementine Decretals"—were embodied in the *Corpus* and became parts of it. Thus completed, the entire work has continued to be the standard of the canon law. The best editions are those of Böhmer (1747) and Richter (Leipzig, 1833, 1877-81). See **CIVIL LAW; CANON LAW**; and consult Lee, *Historical Jurisprudence* (New York, 1900).

CORRAL, kôr-räl', POINCIANO (c.1810-55). A Central American general, born in Costa Rica. He settled in Nicaragua early in his youth and became Minister of State in 1853. Subsequently he became identified with the Legitimist Government and commanded the army which defeated William Walker (q.v.) at Managua (1855). Shortly after the battle of La Virgen (September 3, 1855) and the occupation of Granada, he made terms with Walker, who, however, afterwards accused him of treasonable negotiations with leaders of the Legitimist Party. After a brief court-martial Corral was shot, November 8, 1855.

CORREA DA SERRA, kôr-râ'á dá sêr'râ, JOSÉ FRANCISCO (1750-1823). A Portuguese politician, scholar, and botanist, who was educated and took orders in Rome. With the assistance of the Duke of Alafoès he founded the Academy of Science in Lisbon and was made its perpetual secretary. He soon came into conflict with the Church, through the Inquisition, fled to France, and afterwards went to England, where he became secretary to the Portuguese legation. In 1813 he came to New York, and in 1816-20 he was Portuguese Minister at Washington. He had high rank as a botanist, but his principal work is *Collecção de livros ineditos da historia portugueza*.

CORRECTION. See **CRIMINOLOGY; PENALOGY; CHARITIES AND CORRECTION, THE NATIONAL CONFERENCE OF**.

CORRECTION OF THE PRESS. See **PROOF-READING**.

CORREGGIO, kôr-rêd'jô. A city in the Province of Reggio nell' Emilia, North Italy, situated 27 miles east of Parma (Map: Italy E 2). In the Piazza is a statue of the painter Correggio (q.v.), who was born here. The town was once the capital of a principality belonging to the Duchy of Modena, and the princely castle still remains. Population (commune), in 1881, 12,587; in 1901, 14,437.

CORREGGIO, ANTONIO ALLEGRI DA (c.1494-1534). An Italian painter, so called from his birthplace, a small town near Modena. We are less informed about his life than about that of any other of the chief Italian painters. According to the traditional accounts, as given by Vasari and the local historians, Correggio was humble and poor, and passed his life in drudgery. He made an unhappy second marriage, and died under distressing circumstances. But in contemporary documents it appears that his parents were tradespeople in comfortable circumstances, that

he inherited property from his uncle, and was well paid for his work. For his frescoes in the Cathedral of Parma alone he received a thousand gold ducats, besides materials. If he did not seek the courts of princes, where he might have gained high prices, it was because of his financial and moral independence.

Allegri's earliest years were passed in his native town. The lords of Correggio at that time maintained a number of artists and scientists at their Court, and it was in this atmosphere that the young artist grew up. It is generally believed that he acquired the rudiments of painting from his uncle, Lorenzo Allegri, an unimportant local painter. It is also supposed that he was a pupil of Francesco Bianchi-Ferrari at Modena, but late research has pointed out that this is unlikely, because his earliest work bears no resemblance to Bianchi's. Moreover, the latter died in 1510, when Correggio was not over sixteen years old. On the other hand, it is likely that he learned anatomy and optics, in which he excelled, from Giambattista Lombardi, head of the academy at Correggio. He seems ere this to have attracted the attention of Lady Veronica Gambara, of Correggio, about whom the scientific and artistic culture of the little Court centred. A probable tradition represents him as having gone with her to Mantua during the plague in 1511. Certain it is that his first works show the influence of Andrea Mantegna, particularly in his taste for mythological subjects, his love for illusions of perspective, and in the beautiful nude figures of children and geni which abound in his works. It is also likely that he studied under Lorenzo Costa (q.v.), who was at that time head of the school of Mantua, and perhaps under Dosso Dossi (q.v.), who was for a time in Mantua. In Correggio's earlier works we also find traces of the influence of Leonardo da Vinci. This influence appears in the handling of light and the modeling of figures, and is particularly evident in two paintings now considered to be early works of Correggio, viz. a "Holy Family," in the Malaspina Gallery, Pavia, and a "Madonna," in the Museo Artistico of Milan, both of which were formerly in possession of Milanese families. But it is not necessary to assume, as Ricci, the chief authority on Correggio, does, that he must have therefore studied in Milan. He may have become acquainted with Leonardo's work in some other way. A similar supposition is made by Thode, that because of certain resemblances of Correggio's frescoes in the Convent of Paolo, Parma, with Raphael's in the Farnesiana and elsewhere in Rome, the former must therefore have visited Rome in 1517-18. Even granting this resemblance, which is not generally conceded, this conclusion seems unwarranted. An artist of Correggio's merit could not have visited Rome in 1517 without attracting some attention, and Vasari's relations with the artists in Rome were such that Vasari could not have been misinformed when he made the statement that Correggio never visited the Eternal City. Correggio united in himself the tendencies of all the Lombard Schools—of Mantua, Milan, Bologna, and Ferrara—but it is unwarranted to infer that he studied in all of them.

In 1513 he returned to Correggio, and in 1514 he signed a contract to paint an altar-piece for the Franciscan church in that town. In 1518 he removed to Parma in response to an invita-

tion to decorate with frescoes the chamber of the Abbess of San Paolo. In this city he passed the greater part of his remaining life and painted his greatest works; here also he founded his school. Besides numerous easel works and altar-pieces, he was engaged from 1520 to 1524 in painting the frescoes of the cupola of San Giovanni in Parma, and from 1526 to 1530 he adorned the great cupola of the cathedral. In 1530, probably because he was displeased with the criticisms of this last great masterpiece, he returned to his native town, and there passed the remainder of his life in peace and quietness, under the patronage of Veronica Gambara, occupying himself with mythological subjects. He died on March 5, 1534. He was married in 1520 to Girolama Merlini, a maiden of seventeen. She may have been the inspiration of three of his most charming Madonnas, which seem to have been suggested by domestic scenes. She bore him four children, of whom a son and a daughter survived. This son, Pomponio, was a painter, but, unlike his father, a very mediocre one. Girolama died in 1529.

Correggio's individuality is so marked, and his mastery of technique was developed at such an early age, that it is impossible to divide his work into distinct periods, as is done in the case of Raphael. His art, like Michelangelo's, is a steady growth, which was little subject to influence. His earliest works are those executed before 1514, of which, according to the researches of Morelli, there are five in all. A characteristic example is the earliest of them all, a charming "Madonna" in the Uffizi in Florence. She sits enthroned in the clouds, with two angels making music on either side. The general disposition of the picture resembles Mantegna's, but the execution and the delicate transitions from light to shadow, the soft, round figures, and the dreamy, magical tone are characteristics of Correggio. The two paintings mentioned above as showing the influence of Leonardo also belong to this period.

In his large altar-piece for the Franciscans of Correggio (1514), now in Dresden, the painter appears before us with a style already developed. The "Madonna" sits on a high Renaissance throne with two saints on either hand. The most interesting figure of the composition is Saint Francis, whom she is blessing. He seems the incarnation of the happy and gentle spirit that softened and changed the Middle Age. A number of other works of a religious nature belong in the period of 1514-18, among which is the charming "Zingarella" of the Naples Gallery.

The frescoes in the Convent of San Paolo (1518) form an epoch in Correggio's career, for they were his first monumental efforts, and with them he may be said to have begun the school of Parma. They reveal him as a master of mythological representation, the peer of Raphael himself. On the principal wall of the Abbess's chamber is the figure of Diana returning from the chase, in a car drawn by white stags. The ceiling is decorated with a trellis-work of vines, from which peer sixteen little cupids, bearing attributes of the chase—the most bewitching figures imaginable. Lower on the walls are sixteen lunettes filled with the mythological figures, like The Fates, The Graces, and Satyrs.

In the cupola of San Giovanni of Parma Correggio attempted a grander style of composi-



CORREGGIO

"THE HOLY NIGHT," FROM THE PAINTING IN THE ROYAL MUSEUM, DRESDEN

tion (1520-24). This was the first example of a cupola to be treated with frescoes, and Correggio had no precedents to follow. He treated the cupola as if it were the heavens, portraying Christ and the Apostles amid the clouds. In the centre was Christ in glory, a specimen of keenest foreshortening. The Twelve Apostles, rapt in deepest wonder, are seated upon the cloud below, and in the pendentives are the four Evangelists and four fathers of the Church in groups of two—all figures of the utmost nobility of conception. The decorations of the cupola of the Cathedral of Parma (1526-30) are grander still, and constitute his most ambitious effort. Their subject is the "Ascension of the Virgin." In the upper half of the cupola Christ goes forward to meet the Madonna, who is borne upward by a host of angels. In the lower part stand the Apostles gazing in rapt wonder upon the scene, and behind them are a large number of beautiful genii with candelabra and the like, as if preparing for a great celebration. The innumerable hosts of the angels seem to float beneath the Madonna, and the whole picture is animated with ecstatic joy. The color is beautiful and soft—the great fresco has well been termed an apotheosis of color.

These three series of frescoes were his greatest works. But in addition to these Correggio painted many other pictures during the period 1520-30. The famous "Marriage of Saint Catherine," in the Louvre, was painted in 1522. It is impossible to conceive more beautiful and expressive heads than these, or hands and hair more perfectly painted. Correggio's works of this period may best be studied in the galleries of Parma and Dresden. Foremost among them is a series of five great altar-pieces, the best of which are the so-called "Night" and "Day." The latter, which is in Parma, represents the Madonna and a very beautiful Magdalen, painted in the full light of the day, which is wonderfully diffused. The famous "Night," in Dresden (ordered in 1522, but not painted until 1529), is in reality a birth of Christ, in which the light issues from the new-born infant, lighting with wondrous radiance the Madonna, and the faces of the two women and the shepherds, which stand out in vivid contrast to the darkness above. Never were light and shade better handled than in these two pictures. On the other hand, Morelli has conclusively shown that the well-known "Reading Magdalen" of the Dresden Gallery is no Correggio at all, but probably a work of Adrian von der Werff, a Flemish artist.

The last period of Correggio's life was chiefly spent in painting mythological pictures. Earthly love was the theme he sought to portray, and none could portray it better than he. His work is sensuous, but not sensual. His "Io" and his "Leda" are as innocent and charming as the Greeks themselves conceived them. Perhaps the finest of these productions are the "Jupiter and Antiope," in the Louvre, and the "Danaë" of the Borghese Gallery, Rome.

Correggio's canvases are peculiarly impressive because of his wonderful treatment of light and shade, of which he was the greatest master among the Italians. He generally represents the chief figures in high light, which is vividly contrasted with the surrounding gloom. His colors are soft and harmoniously blended, and the values are accurately given; his carnation is

perfect. His figures are faultlessly modeled, and with him a picture is no longer a flat surface. Another chief characteristic of his work is the dramatic action of his figures, which is sometimes so pronounced that their movements seem exaggerated, as was also the case with those of Michelangelo. But in the case of Correggio the effect is softened by the mystic light which envelops the picture. His drawing is said to be inaccurate, but such cases are certainly exceptional. Correggio drew with his brush, so to speak, and the general effect of the pictures is most charming. In the strength of his individuality, in the subjectivity of his pictures, he is second only to Michelangelo. His place in the history of art is among the five great Italian painters, with Michelangelo, Leonardo, Raphael, and Titian. The school of Parma which he founded was not of great importance, Parmigiano (q.v.) being the only pupil of note. But Correggio exercised great influence upon the Carracci in the following century and was the great model of the Baroque painters.

Consult: Morelli, *Critical Studies of Italian Painters*, vol. ii. (London, 1893); Heaton, *Correggio* (London, 1882); Thode, *Correggio*, in *Künstler-Monographien* (Bielefeld, 1898); Landon, *Life and Works of Correggio* (Paris, 1863-20). The best modern works are J. Meyer, *Correggio*, translated by Heaton (London, 1876); and Ricci, *Antonio Allegri da Correggio* (London, 1896).

CORREGIDOR, kōr-rāj'ī-dōr, *Sp. pron.* kōr-rā'nā-dōr' (*Sp. corregidor*, *Port. corregedor*, *correefor*). The Spanish and Portuguese title of the principal magistrate of a town. The term is sometimes applied to certain provincial magistrates.

CORRELATION (*ML. correlatio*, from *Lat. com-*, together + *relatus*, p.p. of *referre*, to refer, from *re-*, back + *ferre*, to bear). The reciprocal influence of plant-organs. The removal or unusual development of one organ may affect the mode of development of others. For example, if the terminal shoot of a pine be cut away, one or more neighboring laterals will grow erect and in a measure take its place, and branches will be formed on all sides of the new leader. Otherwise it would have grown almost horizontal, and become branched only in a horizontal plane. See **GROWTH**.

CORRENTI, kōr-rēn'té, CESARE (1815-88). An Italian statesman, born in Milan, and educated in that city and in Pavia. He originated several important statistical works, and the almanac *Nipote del Vestavverde*. As one of the strongest opponents of Austrian domination in Italy he contributed materially toward the establishment of unification. In the work entitled *L'Austria e la Lombardia* (1845) he set the popular sentiment against Austria, and during the insurrection at Milan (March 18-22, 1848) was appointed Councilor of War and Secretary-General of the Provisional Government, of which he eventually became in some respects the central figure. In 1866 he was intrusted with the organization of the Venetian Provinces, and subsequently served as Minister of Education in the Ricasoli (1866) and Lanza (1869-72) Cabinets. Correnti had exceptional oratorical power and marked literary ability. The publications with which he became identified, either as editor or as

collaborator, have advanced statistical science in Italy.

CORRESPONDENCE (Lat. *com-*, together + *respondere*, to answer, from *re-*, back + *spondere*, to promise). A term used in mathematics to express certain reciprocal relations. If each individual of one group of objects bears a certain relation to a definite number of individuals of another group, and a definite number of individuals of the first group bears the same relation to each individual of the second group, there is said to be a correspondence between the objects of the groups. If 1 of the first group corresponds to B of the 2d, and 1 of the second group corresponds to A of the 1st, the relation is called an A to B correspondence. If $A = B = 1$, it is called a 1 to 1 ($= 1$) correspondence; e.g. two numbers are said to be equal when there exists a 1 to 1 correspondence between their units. In geometry the simplest cases of 1 to 1 correspondence, or 'conformal representations,' are furnished by two planes superposed one upon the other. Here to every point of the first figure there corresponds one and only one point of the second figure, and to every point of the second figure there corresponds one and only one point of the first. The simplest case of Chasles's (q.v.) correspondence formula may be stated thus: If two ranges of points R_1 and R_2 lie upon a straight line so that to every point x of R_1 there correspond in general α points y of R_2 , and again to every point y of R_2 there always correspond β points x of R_1 , the configuration formed from R_1 and R_2 has $(\alpha + \beta)$ coincidences, or there are $(\alpha + \beta)$ times in which a point x corresponds with a point x . From these linear transformations Poncelet, Plücker, Magnus, Steiner, passed to the quadratic where they first investigated 1 to 1 correspondence between two separate planes. The 'Steiner projection' (1832) employed two planes E_1 and E_2 together with two straight lines g_1 and g_2 not co-planar. If we draw through a point P_1 or P_2 of E_1 or E_2 the straight line x_1 or x_2 which cuts g_1 as well as g_2 , and determines the intersection X_2 or X_1 , with E_2 or E_1 , then are P_1 and X_2 and P_2 and X_1 corresponding points. In this manner to every straight line of the one plane corresponds a conic section in the other. In 1847 Plücker had determined a point upon the hyperboloid of one sheet, like fixing a point in the plane, by the segments cut off by two fixed generators upon the two generators passing through the point. This was an example of a uniform representation of a surface of the second order upon the plane. Correspondence relative to surfaces has been studied by Chasles, Clebsch, Cremona, Cayley, and others. In space of three dimensions, only a beginning has been made in the development of this theory. Consult: Schubert, *Kalkül der Abzählenden Geometrie* (Leipzig, 1879); Klein, *Vergleichende Betrachtungen über neuere geometrische Forschungen* (Erlangen, 1872); Möbius, *Der barycentrische Calcul* (Leipzig, 1827).

CORRESPONDENCE CLASSES. See CHAUTAUQUA.

CORRÈZE, kô'rèz'. A south central department of France (q.v.), formerly part of the Province of Limousin, taking its name from an affluent of the Vézère, the Corrèze, which traverses the department from northeast to southwest (Map: France, H 6). Area, 2265 square miles; popula-

tion, in 1896, 310,514; in 1901, 318,422. The surface of the department is mountainous, especially in the north and east, where it is broken in upon by offsets from the Auvergne Mountains, which range from 2500 to 3320 feet (Mont Besson) above the sea. In the south and southwest the soil yields wheat, oats, barley, rye, maize, etc. Wine is also produced, but of poor quality. Coal, iron, and lead are found in considerable quantities. Capital, Tulle.

COR'RIB, LOUGH. A lake in the north of Galway, in the western part of Ireland, with an area of 68 square miles (Map: Ireland, B 3). From its southern end, four miles north of Galway, it discharges its surplus waters by Galway River into Galway Bay. It receives the waters of the Clare and smaller rivers, and those of Lough Mask, through the Pigeon Hole and other caves at its northern end. On its sides are metamorphic rock, carboniferous limestone, and marble. Near it are many monumental heaps and megalithic circles. It contains many islets, and to the west are mountains 3000 feet high.

CORRIENTES, kôr-ryân'tàs. A city of Argentina and capital of the province of that name, situated on the Paraná, just above the mouth of the Paraguay (Map: Argentina, F 9). It has several plazas, hospitals for men and women, a poorhouse and a national college, a normal school and a library. The natural history museum was at one time managed by the naturalist Bonpland. The city is the centre of a fertile district, and has considerable trade in lumber and oranges. Its chief industry is shipbuilding, but there are also meat-curing establishments and a foundry. Population, in 1901, 17,000. Corrientes was founded in 1588. It occupied a place of considerable prominence in the revolutionary movements during the latter half of the nineteenth century.

COR'RIGAN, MICHAEL AUGUSTINE (1839-1902). An American Roman Catholic prelate, born at Newark, N. J. He graduated in 1859 at Mount Saint Mary's College (Emmitsburg, Md.), pursued a theological course at the American College of Rome as one of the twelve students with whom that institution was begun, was ordained priest in 1863, and from 1864 to 1868 was professor of dogmatic theology and sacred Scriptures in the Diocesan Seminary of Seton Hall College (South Orange, N. J.). From 1868 to 1873 he was president of the college, and in 1873 was appointed Bishop of Newark. During his administration of the diocese he greatly increased the number of churches, introduced religious communities, and founded charitable institutions. In 1880 he became coadjutor (with right of succession and the title of Archbishop of Petra) to Cardinal McCloskey, Archbishop of New York, and from that time directed the larger part of the work of the archdiocese. He entered into the office of Archbishop of New York in 1885, and received the pallium in 1886. His administration was marked by the prolonged controversy between Dr. Edward McGlynn (q.v.) and the Roman Catholic Church. He effectively developed the archdiocese, which at the time of his death was one of the largest and most important in the world. Although personally retiring and unobtrusive, he became known, through his many activities, as one of the most prominent Roman Catholics in the United States. He was a scholar of high attainments.

CORROBOREE (Australian). A sort of ceremonial dance, of a more or less public character, in vogue among the Australian aborigines. The corroboree is held at night, and various types of it occur all over the country, or are borrowed from tribe to tribe, some of a warlike, some of an historical, others of a lascivious character. Generally the men do the dancing, and the women furnish the accompanying music. The songs that go with the corroboree give scope for individual and tribal invention. The corroboree combines in itself the elements of the public celebrations among civilized races and the opera of to-day. It is the nearest approach to a national institution among these primitive people. The corroboree serves also as a peace ratification, and as a means of intercommunication, etc.

CORRODI, kōr-rō'dē, WILHELM AUGUST (1826-85). A Swiss poet and draughtsman, born at Zurich. In his poems, many of which are written in the popular dialect, he mirrors the life of his native canton, celebrating its customs and reviving many of its best traditions. His works, which are generally distinguished by a fine sense of humor, include: *Dur und Moll, Aus Natur und Leben* (1855); *Ein Buch ohne Titel, aber für Kinder von sieben bis siebenmal sieben Jahren* (1855); *Waldleben*, a lyrical novel (1857). The works of Corrodi written in the dialect of Zurich include: *De Herr Professor*, an idyl (1872); *De Herr Dokter*, an idyl (1860, dramatized by the author in 1872); *Wie d'Warret wirkt*, a comedy (1887); and a translation of the works of Robert Burns into Swiss German (1872). Corrodi illustrated several of his books.

CORROZZO NUTS. See IVORY, VEGETABLE.

CORRUGATED IRON. A name given to sheet iron or steel in which grooves and ridges have been produced by passing the sheet between rollers, the surfaces of which are formed into rounded grooves and ridges, the ridges of one roller filling the grooves of the other. By corrugation the strength of the metal is greatly increased, and it is adapted for use in many places where a metal covering of lightness and strength is required, such as roofs, awnings, and the side walls of sheds and factory buildings. Corrugated iron is frequently galvanized with a thin layer of zinc to make it less liable to corrode or rust. It is manufactured in a variety of thicknesses and with corrugations varying in size.

CORRUPTION OF BLOOD. The blasting of inheritance: one of the consequences of an attainder for treason or felony under the old common law, whereby the offender was cut off, or outlawed, from all of his blood relationships and so rendered incapable of inheriting lands or of transmitting them by descent to his natural heirs, lineal or collateral. The effect of the corruption of blood being the extinction of the line of heirs of the person attainted, his lands at once, upon his execution, became subject to the law of escheat and became vested in his superior lord. In cases of treason the principle of forfeiture gave the lands to the King absolutely, and in cases of ordinary felony they went to the Crown for a year and a day before escheating to the lord. This barbarous penalty survived in England, nominally at least, until 1870, when it was abolished by the Forfeiture Act. It has never been tolerated in the United States, and is ex-

pressly forbidden by the Constitution, which declares (Art. III., Sec. 3, n. 2) that 'no attainder of treason shall work corruption of blood, or forfeiture, except during the life of the person attainted.' The constitutions of the several States contain similar provisions. See ATTAINDER; FORFEITURE; TREASON.

CORRUPT PRACTICES. Dishonest methods employed with the intent to influence the results of public elections. The practices to which the expression refers are the use of bribery, treating, undue influence, personation of voters, making false election returns, and knowingly making a false declaration as to election expenses. Of these, bribery, personation, and making false returns are common-law offenses, and render the offender liable to indictment, and so, it has been held in England, is the giving of entertainment to voters with the corrupt intention of influencing an election. Any of the acts enumerated above, excepting that of making a false declaration as to election expenses (which is purely a statutory offense), whether criminally punishable or not, will at common law vitiate the result produced by them, and, if the corruption be general, will have the effect of nullifying the election itself.

The prevalence of bribery and other corrupt practices at Parliamentary elections in England, and at all partisan contests in the United States, has in recent years led to the enactment of statutes in both countries to check the evil. The English Parliament led the way in these reforms by enacting the Corrupt Practices Prevention Act in 1854, which was aimed particularly at the practice of electoral bribery. This was followed in 1868 by the Parliamentary Elections Act, and in 1883 by the Corrupt and Illegal Practices Prevention Act. Altogether these statutes constitute a most comprehensive and well-devised body of legislation, and they have proved themselves to be admirably adapted to the end in view. They define with great particularity the acts which shall constitute the prohibited offenses, and prescribe the severe penalties of disfranchisement and the avoiding of the elections for their commission. The personation of voters is made a felony, and bribery and the other practices enumerated are declared to be misdemeanors. Many of the best provisions of these statutes have been incorporated in the election laws of American States. For the history and scope of these laws, see ELECTION; ELECTORAL REFORM. The English law may be further studied in Rogers, *Elections* (17th ed., London, 1895); Mattinson and Macaskie, *Law Relating to Corrupt and Illegal Practices* (3d ed., London, 1892).

CORY. A city in Erie County, Pa., 90 miles southwest of Buffalo, N. Y.; on the Erie, the Philadelphia and Erie, and the Western New York and Pennsylvania railroads (Map: Pennsylvania, B 2). It has steel-works, machine-shops, flour and feed mills, brick-works, and manufactures of tram locomotives, stationary, gas, and steam engines, furniture, radiators, shovels, wrenches, brushes, toys, etc. The State Fish Hatchery is located here, and there are three mineral springs of value. Settled in 1860, Corry enjoyed a rapid growth, due to the existence of petroleum in the vicinity. It is governed under a general 'Act of 1899' by a mayor, elected every three years, and a bicameral city council. Population, in 1890, 5677; in 1900, 5369.

CORRY (from OIr. *coire*, ravine, Swiss *Kahre*). A name applied to the recesses in a mountain slope beneath a sharp peak with serrate spurs, characteristic of the high Alps. These are referred by E. Richter to glacial erosion under specific conditions, although no glaciers occur in them at the present time. See **CIRQUE**.

COR'SAC (native name), or **ADIVE**. A small fox (*Vulpes corsac*) of the deserts of Central Asia, its range extending through the open country from the Ural Mountains and Caspian Sea to Mongolia. It is pale, reddish-yellow in hue, white on the ventral surface, and with the tip of the long bushy tail black. In the sixteenth century it was fashionable as a ladies' pet in France. It digs holes for itself or seizes upon marmot-burrows, preys, chiefly at night, on young marmots, small rodents, insects, etc., and resembles the American kit-fox (q.v.). The Russian traveler Przhevsky reports it as abundant in Tibet, where it is called *karsu* by the Mongols, and is both trapped and run down by dogs. During the breeding season, in February, the high deserts resound with its owl-like cries, night and morning. See **FOX**; and **PLATE OF FOXES AND JACKALS**.

COR'SAIR (Fr. *corsaire*, from Prov. *corsari*, Sp., Port. *corsario*, It. *corsaro*, corsair, from *corsa*, Sp., Port. *corso*, It. *corsa*, course, from Lat. *cursus*, course, from *currere*, to run). A pirate, or freebooter, or the vessel used by one. The term was used with special reference to the marauding vessels of the Barbary powers.

CORSAIR. One of the smallest and most brilliantly orange-red rockfish (*Sebastes rosenbuscus*) of the California coast. See **ROCKFISH**.

CORSAIR, **THE**. A narrative poem by Byron (1814). The romantic adventures of the lofty-spirited pirate who is its hero are supposed to be continued in *Lara*.

CORSE, *kōrs*. The French name of Corsica.

CORSE, **JOHN MURRAY** (1835-93). An American soldier, born in Pittsburg, Pa. In his eighteenth year he entered at West Point, which he left to take up the study of law. He enlisted in the Union army at the outbreak of the Civil War, commanded a division at Memphis, and became brigadier-general in 1863. He distinguished himself in the Chattanooga campaign, was in command of a division in General Sherman's 'March to the Sea,' and was brevetted major-general for his heroism at Altoona Pass (q.v.). He was afterwards collector of revenue in Chicago, and postmaster of Boston.

CORSET (Fr., dim. of *corps*, OF. *cors*, body, from Lat. *corpus*, body). An article appertaining to the costume of women, which was introduced into France about the time of the Revolution, when the French ladies adopted the Greek dress. Previously they had been worn by Germans, by whom they were invented. Bandages resembling corsets were used in Rome during the early ages, but only as a support, until a slender waist was considered a mark of beauty, when they were made to compress the form. Modern corsets are usually made of two thicknesses of white jean, quilted together so as to form vertical cases, in which steels or whalebones are inserted. They are in two pieces, closed in front with steel or whalebone plates, which rest on the breast-bone vertically, and laced at the back as tightly as the wearer may desire.

COR'SICA (Gk. *Kῆρος*, *Kyros*, *Kopols*, *Korsis*, Lat. *Corsica*, Fr. *Corse*). An island belonging to France (the fourth in size of the islands in the Mediterranean, situated between latitudes 41° 21' and 43° N. and longitude 8° 32' and 9° 31' E. (Map: France, P 8). It is separated by the Strait of Bonifacio from Sardinia, on the south, and occupies an area of nearly 3380 square miles. In the northeast is a long, narrow peninsula, pointing in the direction of Genoa and terminating in Cape Corso. In its physical formation Corsica undoubtedly belongs more to Italy than to France. Its surface is traversed by numerous mountain ranges of rugged appearance and covered with beautiful forests. The principal chain runs from north to south, sending off numerous offshoots in every direction. The highest summits of the island are Monte Cinto, 8890 feet; Monte Rotondo, 8600 feet; Monte Padro, 7846 feet; and Monte d'Oro, 7840 feet high. The coasts are precipitous on the west, while on the east they are low, and in some parts even swampy. The chief geological formation is granite, occasionally interspersed with porphyry and serpentine. There are a number of short and swift streams on the island, the principal of which are the Golo, Tavignano, and Taravo. The climate is generally healthful and the temperature moderate, the average for the summer being about 75°. The lower parts of the island are occasionally visited by malaria, but the mountain regions are very salubrious. The vegetation of the island is rich, and the fine forests for which Corsica was famous in ancient times are still found on the mountain slopes. The flora of the valleys does not differ materially from that of Italy. There is an abundance of olives, oranges, citrons, vines, and other Mediterranean plants.

The soil is very fertile, and, according to some estimates, over 40 per cent. of the total area is cultivable. The chief products are wheat, barley, rye, corn, wine, and chestnuts, the latter being used extensively for food. The agricultural work is done in part by laborers who come over from Tuscany. Cattle-raising is carried on on a very large scale, and constitutes the chief industry of the island. There are also good fisheries of tunny and pilchard. Among the minerals mined are iron, lead, copper, and antimony, and there are quarries of granite, marble, and alabaster. The commerce is of little importance. The chief imports are foodstuffs, building materials, and metal ware. The exports consist mostly of kine, olive oil, and fruits. Corsica forms a department of France, and is divided into the five arrondissements of Ajaccio, Bastia, Calvi, Corte, and Sartène. The population in 1896 was 290,168, or nearly 86 per square mile. The Corsicans are of mixed origin, independent in spirit, passionate, and revengeful. (See **VENDETTA**.) They scorn work and pay little attention to the development of the natural resources of their island. The current language is a corrupt Italian. The capital is Ajaccio, with a population of over 20,000.

Corsica is supposed to have been originally inhabited by a people of Iberian origin. It was settled in succession by the Etruscans, the Phœnicians, and the Phœceans, and finally came into the possession of the Carthaginians in the fifth century B.C. Wrested by the Romans from the Carthaginians in the second half of the third

century B.C., the island remained for seven centuries under the sway of Rome, until, after repeated attacks by the Vandals, it finally fell into their hands in 470. After the expulsion of the Vandals by Belisarius in 533, Corsica was occupied successively by the Byzantine Empire, the Goths, Franks, and the Saracens. At the beginning of the eleventh century it came into the possession of the Pisans, by whom it was ceded in 1300 to the Genoese. The rule of the latter was marked by continuous revolts on the island, and the ruling city found itself compelled on several occasions to ask assistance from Austria and France. In 1736 a German adventurer, Baron Theodor von Neuhof, became King of Corsica, but in 1738 he had to lay down his crown. The uprisings under the leadership of Paoli during the second half of the eighteenth century were of the most serious nature. In 1768 Genoa made Corsica over to France. Paoli made an attempt to resist the French rule, but the dispatch of 30,000 French troops to the island compelled him to seek safety in England. He returned in 1790, and in 1793 headed a successful rising, in which the British lent assistance to the patriots. In the following year Corsica came under the protection of Great Britain, from which it obtained a constitutional form of government. Two years later the British were forced by the French to evacuate the island, which has ever since remained in the possession of France. Corsica is noted as the birthplace of Napoleon. Consult: Girolami-Cordona, *Géographie générale de la Corse* (Ajaccio, 1893); Vuillier, *The Forgotten Isles* (New York, 1896); Caird, *The History of Corsica* (London, 1899).

CORSICANA, kôr'sê-kî'nâ. A city and county-seat of Navarro County, Tex., 163 miles northeast of Austin; on the Houston and Texas Central and the Saint Louis Southwestern railroads (Map: Texas, F 3). It is the seat of the State Orphan Asylum, and has an Odd Fellows' widows' and orphans' home. Corsicana is a progressive manufacturing centre, among its industries being cotton-compresses and cotton-gins, cottonseed-oil mills, brick-yards, flour-mills, a grain elevator, foundry and machine shops, planing-mills, etc. It is also the seat of an extensive oil industry, there being in its vicinity a number of wells which were regarded as extraordinary until the discovery of the Beaumont oil-field. Population, in 1890, 6285; in 1900, 9313.

COR'SICAN BROTHERS, THE. A romantic drama adapted by Boucicault from a French play, *Les frères corses*. The twin brothers, Louis and Fabian dei Franchi, are bound together by a strange sympathy, and each is conscious of the other's actions, though distant from him. The dual part of the brothers is a successful rôle of Henry Irving.

CORSINI, kôr-sê'né. A celebrated Florentine family, which from the thirteenth century was prominent in the history of Italy. The most famous was ANDREA (1302-73). Bishop of Fiesole, who was canonized in 1629. He was for forty years a monk in Florence, and then was made Bishop of Fiesole, and later legate to Bologna. That town was in the midst of a civil war, but the eloquence of Corsini was successful in subduing it. Austere in his life and ambitious only for his Church, he was a type of the

medieval bishop. LORENZO became Pope Clement XII. in 1730. He restored the Corsini Palace, now containing the interesting Corsini Gallery.

CORSNED (AS. *corsnad*, from *coren*, p.p. of *cōsan*, Goth. *kiasan*, OHG. *kiasan*, Ger. *kiesen*, to choose + *snad*, bit, from *snīpan*, Goth. *snīpan*, OHG. *snīdan*, Ger. *schneiden*, to cut). A form of ordeal in early English law, which consisted in administering to the accused a morsel of barley bread, about an ounce in weight, which had previously been endowed by excretion with the magical power of exposing his guilt or innocence. If the accused was innocent, the bread was readily swallowed; if guilty, it stuck in his throat and killed him. It was in this way (the chroniclers tell us) that Godwin, Earl of Kent, met his fate in the reign of Edward the Confessor when accused of the death of the King's brother. Compare the similar ordeal of the 'water of jealousy,' which, according to the Mosaic law, was administered among the Jews to a woman charged with adultery (Book of Numbers, chap. v.). See ORDEAL. Consult Blackstone, *Commentaries on the Laws of England*, bk. iv., p. 345.

COR'SO (It., course). A word used to express not only the racing of horses (without riders), but also the slow driving in procession of handsome equipages through the principal streets of a town, such as almost always takes place in Italy on festivals. This custom has given the name Corso to the principal streets in almost all the larger towns of Italy. The best known of these is the Corso in Rome, which is the scene of the celebrated diversions of the carnival (q.v.) and the favorite meeting-place of fashionable society.

COR'SON, HIRAM (1828—). An American scholar. He was born in Philadelphia, November 6, 1828. He held positions in the Library of Congress and the Library of the Smithsonian Institution from 1849 to 1856, and taught afterwards in Girard College, Philadelphia, and Saint John's College, Annapolis, and in 1870 became professor of the English language and literature in Cornell University. Later, the chair of English literature was created for him. He has published *Handbook of Anglo-Saxon and Early English* (1871); *Introduction to the Study of Browning* (1886); *Introduction to Shakespeare* (1889); *Primer of English Verse* (1893); *The Aims of Literary Study* (1894); *Selections from the Canterbury Tales* (1896); *The Voice and Spiritual Education* (1896); *Introduction to John Milton* (1899). His Shakespearean textual criticism is of the highest value, and his interpretation of poets is luminous and sympathetic.

CORSON, JULIET (1842-97). An American educator and author, born in Boston. She was secretary of the New York Free Training School for Women in 1872-73, and devoted herself to study and experiments on healthful and economical cookery and dietetics. In 1876 she established the New York School of Cookery. She wrote several popular books, among them, *Fifteen-Cent Dinners for Workingmen's Families* (1877); *Dietary for Schools* (1878), prepared at the request of the United States Commissioner of Education; and *Sanitary Living*.

CORS'SEN, WILHELM (1820-75). A noted German philologist, who devoted himself espe-

cially to the ancient Italic languages and dialects. He was born in Bremen, January 20, 1820, studied philology in Berlin 1840-44, and became professor of classical philology at Schulpforta in 1846. He retired in 1866 and dedicated the remaining years of his life to research. He died at Lichterfelde, near Berlin, June 18, 1875. His most important work, *Ueber Aussprache, Vokalismus und Betonung der lateinischen Sprache*, was published in two volumes in Leipzig, 1858-59, receiving the prize of scholarship. A second edition appeared in 1868-70, and remains a work of authority on the subject. It was followed and completed by *Kritische Beiträge zur lateinische Formenlehre* (1863) and *Kritische Nachträge* (1866). Corssen afterwards set himself to prove that the Etruscans were an Italic people, allied closely to the Latins, in support of which theory he published a monumental work, *Ueber die Sprache der Etrusker* (2 vols., Leipzig, 1874-75), on which he lavished all the force of his genius and erudition; but his arguments met at once violent and universal opposition (see especially Wilhelm Deecke, *Corssen und die Sprache der Etrusker, eine Kritik* (Stuttgart, 1875), and have never found support. This failure of his cherished hope doubtless hastened his death.

CORT, kōrt, CORNELIS (c.1536-78). An eminent Dutch engraver, born in Hoorn, Holland. He was first instructed by Hieronymus Cock, for whom he executed several plates which were published with the signature of his master. In 1566 he visited Venice, where he was entertained by Titian, whose best works he reproduced. In 1571 he went to Rome and established an influential school there. The art of engraving had previously been confined to small plates, and Cort was the first to use a larger size. He reproduced the chief works of Raphael, Correggio, Michelangelo, and others, besides designs of his own, the best of which are perhaps the "Birth of the Virgin" and the "Holy Family with a Pear." He died in Rome in 1578.

CORT, FRANS DE (1834-78). A Flemish lyrical poet, born in Antwerp. After being associated with the publication *Grondwet*, he was appointed editor of the *Schelde* (1858). He was secretary to the general auditor of the military court at Brussels from 1861 until his death. He was one of the most distinguished lyrical poets of Belgium, and his songs, although not conspicuous for fancy or imagination, are full of deep and genuine sentiment. His works comprise: *Liederen* (1857-59); *Zing-Zang* (1866); and *Liederen* (1868). He also translated *De schoonste liederen van Robert Burns* (1862), and after 1861 conducted the periodical *De Toekomst, tijdschrift voor opvoeding en onderwijs, taalen letterkunde*.

CORTE, kōrt. The capital of an arrondissement in the Department of Corse (Corsica, q.v.) at the confluence of the Tavignano and Restonica, 52½ miles northeast of Ajaccio by rail. It is picturesquely situated amid mountain and valley scenery, and is protected by a commanding citadel which has sustained many notable sieges. Corte was the seat of Paoli's reform Government. It has a university founded by that patriot, a communal college, an ancient palace, and an old Franciscan monastery which served as the Parliament house in 1765. There are

monuments to Pasquale Paoli, Joseph Bonaparte, and General Casanova, Duke of Padua. Marble is quarried extensively in the neighborhood. Population, in 1901, 5425.

CORTEGIANO, kōr'tā-jā'nō, IL. (The Courtier). A famous work on manners and etiquette by Baldassare Castiglione, published in 1528. It depicts in elegant language the polished Italian gentleman of the time of the Renaissance. There is an English translation by Thomas Hoby (1561).

CORTEREAL, kōr'tā-rā'ā'l, GASPARD (c. 1450-1501). A Portuguese navigator. In the course of two or three voyages in 1500 and 1501, he seems to have visited the North American coast at various points between Labrador and the Bay of Fundy. From his last voyage he did not return. In 1502 his brother MIGUEL, also a well-known navigator, sailed in search of him, but likewise was lost, probably on the northern coast of North America or in the Arctic Ocean. Consult HARRISSE, *Les Corte-Real et leurs voyages au nouveau monde* (Paris, 1883).

CORTES, kōr'tās (Sp., Port. pl. of *corte*, court). The name given in Spain and Portugal to the assembly of representatives of the nation. As one district of Spain after another was recovered by the Christian princes from the Moors, there arose in each a corporation composed of the different 'estates' or orders of the population, limiting the power of the princes. From the union of several of these territories were formed the two leading kingdoms of Castile and Aragon, each having its Cortes, representing the clergy, the nobility, and the cities. In Aragon the Cortes appointed a judge, known as the Justiciar, who decided disputes between the King and his subjects, and confined the royal power within constitutional limits. In Castile the rights of the burghers were less extensive than in Aragon, but in both States the King was dependent on the Cortes. After the union of Castile and Aragon the Crown succeeded in greatly lessening the powers of the Cortes, and it was seldom assembled except to do homage or to sanction an arrangement as to the succession to the throne. After 1713 it did not meet till 1789, on the accession of Charles IV. In 1809 the Cortes, as composed in 1789, was assembled by the Junta, and framed a new constitution, called the Constitution of 1812, which, however, was set aside at the Restoration. For the present Constitution of the Cortes, see SPAIN, paragraph on *Government*.

The history of the Portuguese Cortes is very similar to that of the Spanish. In 1826 Dom Pedro promulgated a new constitution after the model of the French, calling the Cortes again into life, and abdicating at the same time in favor of his daughter, Maria da Gloria. This Constitution was set aside during the usurpation of Dom Miguel, but was restored in 1842. Consult: Muro y Martinez, *Constituciones de España* (Madrid, 1881); Desdevisu du Degert, *L'Espagne de l'ancien régime* (Paris, 1897-99), which contains a bibliography; Colmeiro, *Cortes de los antiguos reinos de Leon y de Castilla* (2 pts., Madrid, 1883-84); Stephens, *Portugal*, in the "Stories of the Nations" Series; Prescott, *Ferdinand and Isabella* (in numerous editions).

CORTÉS, kōr-tās', HERNÁN or HERNANDO (1485-1547). Conqueror of Mexico. He was

born at Medellin, in Estremadura, Spain, and was sent to the University of Salamanca, but his superabundant animal spirits and unrestrained passions for the fair sex cut short his university career. The same cause made it impossible for him to remain at home, and so he decided to try his fortune in the New World. An accident, received in scaling a tumble-down wall while on his way to a final clandestine rendezvous, postponed his departure until the spring of 1504, when he sailed for Santo Domingo. There he joined the forces engaged in suppressing a native revolt, and quickly won promotion, so that in 1511 he was the chief executive officer with the expedition dispatched under Velazquez for the conquest of Cuba, becoming subsequently Alcalde of Santiago. Mining and stock-raising, although profitable, were not sufficiently to his taste, and he persuaded Velazquez to give him the command of an expedition to the mainland, made known at that time by the discoveries of Grijalva. No expense was spared in equipping a fleet of seven vessels, carrying three hundred men. Velazquez, however, became suspicious lest Cortés should refuse to recognize his authority when once he was in a position to establish himself independently. Learning that he was to be superseded, Cortés gathered his forces and set sail, on November 17, 1518, before Velazquez could order him to resign the command. Stopping for supplies at the settlements on the coast of Cuba, he proceeded to Cozumel Island, sailed along the Yucatan coast and fought a bloody battle with the natives at Tabasco. In the early spring of 1519 he landed at San Juan de Ulloa. There he obtained numerous captives, one of whom was the famous Marina, whom he made his mistress, and who, out of devotion to him, acted as the interpreter, guide, and counselor of the Spaniards, and frequently saved them from serious reverses. Finding a better harbor a little north of San Juan, the Spaniards removed thither and established a town, naming it La Villa Rica de Vera Cruz. An independent government was organized by vote of the settlers, who determined to renounce their allegiance to Velazquez and to acknowledge only the supreme control of the King in Spain. In order to prevent those who opposed this movement from deserting him and carrying the news to Cuba, Cortés dispatched one vessel to Spain with messengers to represent his cause at the Court, and then sank the rest of his fleet.

Starting on his march inland, Cortés entered the country of the Tlascalans, who fought him vigorously for a few days, but soon came to terms with the strangers and joined them against the Aztecs, by whom the Tlascalans had been subjugated not long before. From this time until the conquest was achieved, the tribe continued the most important and trusty of all the native allies of the Spaniards. Advancing into the country of the Cholulans, Cortés succeeded, after a little fighting, in persuading the people to accept a reconciliation with their traditional enemies from Tlasecala and to join them in his train for the march on Mexico. Motecuhzoma, or Montezuma, the Aztec chief-tain, pursued an irresolute policy and finally determined not to oppose the Spaniards directly by force of arms, but to await their arrival and learn more of their purposes. On November 8, 1519, Cortés entered the City of Mexico and

established himself in one of its large communal dwellings, which had belonged to the family of Motecuhzoma's predecessors. The Spaniards were allowed to roam through the city at their pleasure, and found much gold and other treasures in the storehouses. Realizing that a party among the native leaders were talking of driving the strangers out of town, Cortés induced Motecuhzoma to come to his house, where he was kept as a hostage. Shortly after, in April, 1520, messengers brought word that an expedition sent from Cuba by Velazquez, under the command of Narvaez, had landed at San Juan de Ulloa, with orders to arrest Cortés and send him to Cuba for punishment. Cortés promptly started for the coast with a small force. He found the camp of his enemies unguarded, entered on a dark night, captured Narvaez, and the next day induced nearly all the soldiers to join his own standard. Meanwhile, in Mexico, Alvarado, who had been left in command, had learned that the Aztecs intended to attack him at the close of a great religious ceremony which was then being held. To prevent this, Alvarado suddenly surrounded the leaders, who were all busy with the sacrifices in one of the large courtyards of the town, and killed most of them. Cortés, as soon as all danger from Narvaez was past, hastened back to Mexico. He was allowed to enter the city peaceably, with his followers, but was immediately surrounded and attacked. As there was no possibility of maintaining his position in the city, for lack of food or water, and as all hope of persuading the natives to desist vanished when Motecuhzoma died, an immediate retreat was decided on. Selecting a dark, rainy night—the famous *Noche Triste*, on June 30—the Spaniards and their native allies started out of the city. The Mexicans pressed on behind them. The Spaniards were hurried along the causeways or driven into the water, where they were seized by Mexicans in canoes and dragged off to the city for sacrifice. Some forty Europeans were captured alive, the great object of their enemies. Luckily for their fellows, the prospective sacrifices attracted the larger part of their assailants back into the city. Cortés retreated toward Tlasecala. At Otumba he was confronted by an overwhelming force of his enemies. In despair the harassed Spaniards hurled themselves upon the Aztecs and crushed them. They nevertheless continued their retreat to Tlasecala, where they recuperated during the summer.

The arrival of several vessels with men and war munitions enabled Cortés to reorganize his army, so that he was prepared to take the field again in October. The outlying Aztec strongholds were captured one by one, and the various subject tribes, ever ready to rebel against their native conquerors, gradually recovered confidence in the white men. Carpenters had been set to work at Tlasecala in constructing a fleet of small vessels, which were hauled along a canal dug for the purpose into the Mexican lake, so that it became possible to attack the city by water as well as along the causeways which connected Mexico with the land. By the end of April, 1521, with a force of over nine hundred Spaniards, and eighty-seven horses, Cortés again approached the capital. The city was attacked by columns along each of the three causeways from the shore, while the fleet of brigantines, with

cannon, engaged the vast number of canoes on the lake. For three months the Aztecs defended their homes stubbornly. Street by street was taken by the Spaniards, who were obliged to tear down each house as soon as they had stormed it, to prevent the natives from returning to the attack. At last, on August 13, the chief, Guatemozin, who had been the principal organizer of the defense, was captured while trying to escape in a canoe, and the war ended. Cortés promptly set to work to repair the loss he had caused. The ruins of the city were used to fill in the marshy ground so as to afford a secure foundation for new edifices. Colonists were brought from Spain, and in a very short time the City of Mexico became the principal European city in America. Numerous expeditions were sent off in all directions, to Tampico, across Honduras to the Gulf Coast, and to the Pacific, where Cortés established a shipyard in which were built the vessels he used later in his explorations of the Pacific Coast.

Meanwhile his enemies in Cuba and Spain were planning Cortés's destruction. Officials were sent to Mexico to investigate his acts and supersede him, but he succeeded in persuading them to return without disturbing him. In 1528, however, when Estrada arrived with explicit orders to take over the government, Cortés yielded without opposition and took ship for Spain. There he was welcomed with royal honors, was created Marquis of the Valley of Oaxaca, the fairest domain in the New World, and was reappointed Captain-General, although not restored to the civil governorship of Mexico. He married the daughter of the Count of Aguilar and niece of the Duke of Bejar. In 1530 Cortés returned to Mexico, where he amused himself for the next ten years with schemes for further conquests. But the civil government being in other hands, he found himself constantly checked in his activity, his property detained from him, his rights interfered with, and his prestige rapidly waning. In 1536 he discovered Lower California, and explored the Pacific coasts of Mexico, but no second treasure-trove awaited him. In 1539 Coronado secured the right to seek for the 'Seven Cities' of Marcos de Niza, and in disgust Cortés went back to complain to the Court. He was received with honor, but could secure no substantial assistance toward recovering his rights or his property. Joining an expedition to Algiers, he was shipwrecked, losing a large part of his fortune. He then retired to a small estate near Seville, where he died, December 2, 1547. There is no good biography of Cortés. Prescott's *Conquest of Mexico* is, so far as Cortés is concerned, little more than an admirer's abstract of the conqueror's official dispatches, which may be consulted in Folsom's translation (New York, 1843). The celebrated "Fifth Letter," describing Cortés's adventurous trip across Honduras in the winter of 1524, is in the Hakluyt Society Series for 1868.

CORTÉS, JOSÉ DOMINGO (c.1830-84). A Chilean author, born at Coquimbo. He was successively journalist, member of the Chilean legation in Belgium, and director-general of libraries in Bolivia. He published anthologies, histories, and biographical works, such as *Diccionario biográfico americano* (1876); *Historia de Bolivia*;

Los revolucionarios de la independencia de Chile; and *República de Méjico* (1872).

COR'TEX (Lat., bark). That region of a stem or root which occurs between the central vascular region (*stole*) and the epidermis. In those stems which increase in diameter each year, the cortex becomes very much modified by the development of cork cells, being then usually called 'bark.' See ANATOMY OF PLANTS.

CORTINA, kôr-té'ná, JUAN NEPOMUCENO (1830—). A Mexican soldier and brigand, born in La Higuera, State of Tamaulipas. During the Mexican War he organized a band of cowboy guerrillas, later incorporated in the Mexican army. He fought at Palo Alto, rose to the rank of captain, but at the conclusion of the war was refused a commission in the regular army. Thereupon he turned smuggler. Later he rose to be a general in the liberal-revolutionist forces, but after his defeat by General Hinojosa was forced to escape to the United States. From 1859 to 1863 he held sway on the frontier, devastating the country and making such official appointments as he saw fit. He supported the cause of Maximilian in 1864, in 1867 again joined the Republicans, and in 1869 was appointed, by Juarez, federal chief of Tamaulipas. In 1876 he was arrested by General Canales, but instead of being executed, as General Diaz had directed, was incarcerated without trial in the military prison of Santiago Tlateloleo.

CORTINA'RIOUS. See FUNGI, EDIBLE, and Plate.

CORTLAND. A city and county-seat of Cortland County, N. Y., 37 miles south of Syracuse; on the Tioughnioga River, and on the Lackawanna and the Lehigh Valley railroads (Map: New York, D 3). It is the seat of a State normal school, and, as a manufacturing centre, produces extensively wire, wire-cloth, carriages and wagons, carriage-trimmings, drop-forgings, door and window screens, wall-paper, etc. The government, under a charter of 1900, is vested in a mayor, elected biennially, a municipal council, and administrative boards and officials appointed by the executive, the appointments, except the board of education, being subject to the consent of the council. First settled in 1792, Cortland was included in the township of Homer until set off as Cortlandville in 1829. Population, in 1890, 8590; in 1900, 9014.

CORTONA, kôr-tó'ná. A city in the Province of Arezzo, Central Italy, situated 2170 feet above the sea, 72 miles southeast of Florence and 4 miles north of Lake Trasimeno (ancient Trasimenus) (Map: Italy, F 4). It has well-preserved cyclopean walls, 8500 feet in circumference, the ruins of a temple of Bacchus, a museum of Etruscan antiquities assembled by the Etruscan Academy, founded in 1726; a cathedral containing paintings by Luca Signorelli (q.v.), who was born here in 1441, as was Cortona (q.v.) in 1596. The thirteenth-century church of San Domenico also contains excellent paintings. The ancient Cortona, called Kyrtonia by Polybius, was the strongest of the twelve cities of the Etruscan League. As a Roman colony it lost its importance, but in the eleventh century again prospered. It sided mostly with the Ghibellines, came into the possession of the Casale family in the fourteenth century, in 1409 was given by the last of the house to King

Ladislas of Naples, and by him in 1412 to Florence. Population (commune), in 1881, 26,353; in 1901, 29,343.

CORTONA, PIETRO DA (1596-1669). An Italian painter and architect, born at Cortona. His real name was Berettini. A "Nativity" by him attracted the attention of Pope Urban VIII., who gave him the order to paint the decorations for a chapel at Bibiana. He also painted the decorations in the grand salon of the Barberini Palace. For a long time this was considered the finest work in Italy of the seventeenth century, and although his reputation has suffered since then, his pictures are still admired. There are many of them in the Louvre in Paris. Cortona decorated ceilings in the Pitti Palace and was architect for the façade of Santa Maria in Via Lata, the portico of Santa Maria della Pace, and the Church of San Martino, all in Rome.

CORUÑA, kō-rōn'nyá. A fortified seaport of Spain, capital of the province of the same name, in Galicia, situated on a small headland in the Atlantic, formed by the three bays of Betanzos, Coruña, and El Ferrol; 315 miles northwest of Madrid (Map: Spain, A 1). It is built partly on the slope and partly at the foot of a hill and is divided into the upper and lower towns, the former being the most ancient. The lower town, which was formerly an insignificant fishing village, is now more important, is well built, with streets broad and well paved. The ancient section, which is partly surrounded by the old walls, contains the more prominent edifices, though there are comparatively few public buildings of note in Coruña. The churches of Santiago and Santa María del Campo, of the twelfth century; the barracks, the Capitania-General, and the modern Military Hospital of San Carlos, are worthy of mention. The provincial institute has a considerable library and valuable scientific collections, and the city contains also a meteorological observatory, and various educational institutions, including a marine school. Other features of interest are the grave of Sir John Moore (q.v.), with a monument in the garden of San Carlos, and the so-called Torre de Hercules, of doubtful Phœnician origin, having been built more probably in the time of Trajan, which has served as a lighthouse for more than a century. The harbor, protected by five forts, two of which, San Centón and Santa Cruz, defend the entrance, is safe and commodious. Coruña is the centre of an extensive commerce, the exports comprising live stock, fruits, vegetables, wine, hams, sardines, leather, peat, etc., while the principal imports are sugar, hides, coal, oil, and manufactured articles. There is also an important coastwise trade. The city has a variety of manufactures, including cigars, linen goods, canvas, eordage, lumber, barrels, paper, etc., and many of the inhabitants are employed in the fisheries. Population, in 1897, 40,500; in 1900, 44,057.

Probably from early times a fishing village, Coruña may have been colonized by the Phœnicians. Its chronicled history dates from the Roman occupation. In the Middle Ages it was called Caronium. It was part of the emirate of Cordova for some time, and suffered severely, with the rest of Galicia, in the reconquest. The Portuguese captured the town in 1370. Here John of Gaunt landed in 1386, to urge the claims of his wife to the Castilian crown, and in 1554

Philip II. sailed from the port to marry Queen Mary of England. Coruña was the point of departure of the "Invincible Armada" in 1588, and in the following year it was taken by Drake and Norris, and nearly destroyed. The harbor was the scene of English naval victories in 1747 and 1805. Coruña is famous for the repulse, on January 16, 1809, of the French under Marshal Soult, by Sir John Moore, who succeeded, with an inferior force, in withstanding the French attempt to stop the English embarkation, but lost his life in the battle. The engagement took place on the heights of Elviña. In 1823 the city fell into the hands of the French. It was visited by an epidemic of cholera in 1851.

CORUNDUM (Neo-Lat., from Hind. *Kurand*, corundum), or ADAMANTINE SPAR. An anhydrous aluminum peroxide that crystallizes in the hexagonal system. Owing to their extreme hardness (in which corundum ranks next to the diamond) and their high specific gravity (from 3.95 to 4.10), the colored varieties are much sought after as gems. According to their colors, they are called sapphire, which is blue; Oriental ruby, which is red; Oriental topaz, which is yellow; Oriental emerald, which is green; and Oriental amethyst, which is purple. In addition to these, there is the *asteriated* or *star* sapphire, which exhibits an opalescent star of six rays. The dark-colored varieties are called *corundum*, and granular corundum is known as *emery*. The colored varieties of corundum are found chiefly in Burma, China, Ceylon, and the United States. In this country it is found in the crystalline rocks along the Appalachian Mountains, at Chester, Mass., in northern Georgia, and in Montana, where sapphires of gem grade have been found. Emery (q.v.), which is used as an abrasive material, is found in Asia Minor, at Chester, Mass., and in Canada.

CORUN'NA. A city and the county-seat of Shiawassee County, Mich., 30 miles northeast of Lansing; on the Shiawassee River, and on the Ann Arbor and the Detroit, Grand Haven and Milwaukee railroads (Map: Michigan, J 6). It has a considerable trade in coal, and manufactures, flour, furniture, shoes, lumber, etc. Population, in 1890, 1382; in 1900, 1510.

CORVAL'IS. A city and the county-seat of Benton County, Ore., 96 miles south by west of Portland; on the Willamette River, and on the Southern Pacific and the Corvallis and Eastern railroads (Map: Oregon, B 5). River steamboat lines add to the transportation facilities, and the city carries on a considerable trade in grain, lumber, flour, live stock, and wool. The manufactures include lumber, sash, doors, furniture, flour, foundry products, organs, carriages, etc. Corvallis is the seat of the State Agricultural College, and contains a fine court-house, public-school building, and city hall. Population, in 1890, 1527; in 1900, 1819.

CORVÉE, kōr'vá' (Fr., from ML. *corvata*, demanded, from Lat. *corrogata*, demanded, sc. *opera*, work, from *com-*, with + *rogare*, to demand). An obligation imposed under the feudal law, whereby the inhabitants of a district performed certain services, such as repairs of the highway and bridges, for the sovereign or the feudal lord. The system was enforced by the Dual Control in Egypt, where, in 1882, 234,000 *fellaheen* were called out

for 100 days to clean the irrigating canals; but the obligation was gradually abolished until, in 1887, through the efforts of the British, the corvée was wholly done away with, and the labor performed by contract.

CORVEL, kôr'vî (ML. *Corbeia Nova*, New Corbeia, as it was first occupied by monks from Corbie). A Benedictine abbey of Germany, on the Weser, near Hörter, the oldest and most famous abbey in Saxony. It was founded by Louis the Pious in the beginning of the ninth century, being a colony from the monastery of the same name in Picardy. It received rich endowments and was the centre of great agricultural improvement and prosperity during the earlier part of the Middle Ages, besides being the seat of a famous school. In 1793 it was made a bishopric by Pius VI. Its territory then embraced about 22 square miles, with 10,000 inhabitants. In 1802 it was secularized and annexed to Nassau, from which it was transferred, in 1807, to Westphalia, and in 1815 to Prussia. The church of the abbey is built in Gothic style, magnificently adorned in the interior, and contains a multitude of monuments of successive dynasties. The library and archives of the cloister, which contained most valuable records of the early ages of German history, have all been destroyed, the *Chronicon Corbeicense*, an alleged record of this abbey from its foundation to the end of the twelfth century, being a forgery. Certain brief *Innales Corbeenses* from 648 to 1148 are, however, printed in the *Monumenta Germaniæ Historica*. Consult Wigand, *Geschichte der Abtei Korvey* (Hörter, 1819).

CORVETTE, kôr-vêt' (Fr., from Sp. *corveta*, *corbeta*, It. *corvetta*, corvette, from Lat. *corbita*, slow ship of burden, from *corbis*, basket). In the days of sailing men-of-war, a corvette was a ship-rigged vessel (i.e. having three masts, all square rigged), carrying all her broadside guns on one covered deck. The upper deck, above the guns, was *flush* (i.e. was continuous from stem to stern, without poop or topgallant fore-castle). Corvettes occasionally had a bow or stern chaser on the upper deck.

CORVIDÆ (Neo-Lat. nom. pl., from *corvus*, crow). A family of passerine birds which includes the ravens, crows, magpies, jays, etc. See these words, and Plate of JAYS, MAGPIES, ETC.

CORVIN-WIERSBITZKI, kôr'vên-vêrs-bit'skê, OTTO VON (1812-86). A German author, born at Gumbinnen. He took part in the revolutionary uprising in Baden in 1848 and 1849, and became chief of the General Staff of the Republican forces at Rastatt. He was condemned to death, but the sentence was commuted to six years' solitary confinement. In 1855 he went to London, whence in 1861 he proceeded to the United States to act as the war correspondent of the Augsburg *Allgemeine Zeitung*. During the Franco-German War he was the correspondent of the Vienna *Neue Freie Presse*, and his experiences are admirably described in his well-known book, *In France with the Germans* (1872). In his earlier years Corvin devised 'Corviniello,' a species of metal-work inlaid with mother-of-pearl, stones, or other materials. His numerous historical and other writings include: *Historische Denkmale des christlichen Fanatismus* (1845), the second edition of which appeared under the title *Pfaffenspiegel*

(1869), and was further supplemented by *Die Geissler* (3d ed., 1892-93). Consult his *Erinnerungen aus meinem Leben* (4th ed., Rudolstadt, 1890-92).

CORVINO, kôr-vê'nô. A miserly fortune-hunter, the husband of Celia, in Jonson's *Volpone*. He is condemned, in the last act, to be rowed—

"Round about Venice, through the Grand Canal
Wearing a cap with fair long asses' ears."

CORVINUS, MATTHIAS. See MATTHIAS CORVINUS.

CORVO (Sp., crow). The most northerly of the Azores (q.v.). (Map: Portugal, A 4.)

CORVUS, MARCUS VALERIUS. A general of the early Roman Republic. He was born about B.C. 370. He was twice dictator and six times consul, and occupied the curule chair twenty-one times. He defeated the Gauls, the Volsci, the Samnites, the Etruscans, and the Marsi. He lived to be one hundred years old.

CORWIN, EDWARD TAXJORE (1834—). An American writer, and historian of the Reformed Dutch Church. He was born in New York City, July 12, 1834; graduated at the present College of the City of New York in 1853, and at the Theological Seminary in New Brunswick, N. J., in 1856. He has held various pastorates, but his reputation rests upon his literary work, which has made him the recognized historian of his denomination. He has published in book form: *Manual and Record of the Church of Paramus, N. J.* (New York, 1858; 2d ed. 1859); *Manual of the Reformed Protestant Dutch Church in North America* (1859; 4th ed. 1902); *Millstone Centennial* (1866); *Corvin Genealogy* (1872); *A History of the Reformed Church, Dutch* (1895). He has for many years been engaged upon a translation and elaborate annotation of the so-called Amsterdam Correspondence, or the letters which passed between the Classis of Amsterdam and the churches in the New Netherlands and Province of New York, and so are an important historical source. He discovered much of this correspondence himself. Its publication by the State of New York was authorized in 1900.

CORWIN, THOMAS (1794-1865). An American lawyer and statesman, born in Bourbon County, Kentucky. He studied and practiced law in Ohio, where his eloquence soon won him prominence. He was a member of the State Legislature from 1822 to 1829, and of Congress from 1830 to 1840, when he was chosen Governor of Ohio. From 1844 to 1850 he was a member of the United States Senate, and in the latter year became Secretary of the Treasury in President Fillmore's Cabinet. He was again in Congress (1858-60) and was Minister to Mexico from 1861 to 1864. As an orator he won his greatest distinction, his speeches both on the stump and in debate being examples of remarkable eloquence. His arraignment of the administration for the war with Mexico was a notable effort, which made him many enemies and damaged his political career. Consult: Strohn (editor), *Life and Speeches of Thomas Corwin* (Dayton, 1859); and Russell, *Thomas Corwin* (Cincinnati, 1882).

CORRY, CHARLES BARNEY (1857—) An American ornithologist, professor and honorary

curator in the ornithological department of the Field Columbian Museum in Chicago. His publications include *Birds of the Bahama Islands*, *Birds of Haiti and San Domingo*, *Catalogue of West Indian Birds* and *The Birds of the West Indies*.

CORY, WILLIAM JOHNSON (1823-92). An English poet, son of Charles Johnson, of Torrington, Devonshire; his mother was a grandniece of Sir Joshua Reynolds. He was educated at Eton, and at King's College, Cambridge; was graduated B.A. in 1845, and in the same year became fellow of his college. He was at once appointed assistant master of Eton, where he won great distinction as a tutor. In 1872 he retired from Eton and changed his name to Cory. His subsequent home was Hampstead, where he died, June 11, 1892. Cory is mainly known for a volume of verse entitled *Ionia* (1858), containing "Minnermus in Church" and other poems of great tenderness and beauty. The volume was reissued, with additions, in 1891. He is also author of an agreeable *Guide to Modern English History* (1880-82), and of several graceful Latin lyrics in *Lucretilis*, a treatise on writing Latin verse (1871). After his death appeared his *Letters and Journals* (Oxford, 1897).

CORYAT, kôr'yat, or **CORYATE**, THOMAS (1577-1617). An English traveler and author, born at Odcombe and educated at Oxford. He made an extensive tour of Europe, traveling mostly on foot, and published his experiences in a volume entitled *Coryat's Crudities* (1611). It was the first manual of Continental travel, and was illustrated with engravings. Coryat made other voyages through Greece, Asia Minor, North Africa, and India, where he died.

CORYBANTES, kôr'i-bân'têz (Gk. *Κορυβάντες*, *Korybantes*). Mythical beings, attendant upon the Phrygian Cybele, as the Curetes belong to the Cretan cult of Zeus and Rhea. Unlike the Curetes, with whom they were sometimes confused, the Corybantes were not believed to dance in armor, but rather to perform wild and orgiastic dances which frequently ended in ecstasy. The name does not properly denote priests or human beings at all; but, as the priests of Cybele imitated these dances, like modern Dervishes, the name is sometimes extended to them.

CORYCIA, kô-rîsh'i-â (Lat., from Gk. *Κορυκία*, *Korykia*). The mother of Lycoris, by Apollo. She was a nymph, whose name is preserved in the Corycian Cave on Mount Parnassus, and in the appellation Coryceides applied to the nymphs of the cave and to the muses.

CORYD'ALIS. See FUMARIACEÆ.

CORYDALIS (Neo-Lat., from Gk. *κορυδαλλίς*, *korydallis*, *κορυδάς*, *korydos*, crested lark, from *κόρυς*, *korys*, helmet) or DOBSON. A genus of large, net-veined insects (true Neuroptera), representing the family Sialidæ, and peculiar to America, where its larva, used for bait under the names 'crawler,' 'dobson,' 'hell devil,' and many others, is the largest of our aquatic insects. The single species (*Corydalis cornuta*), often called 'hellgrammite,' is brownish-green in color, about two inches in length, and expands its four nearly equal wings fully six inches. "In the female the jaws are very large, flat, and toothed at the extremity, but in the male they are remarkably long and slender, not toothed, and the sharp tips

crossing each other: their only use is evidently for seizing the soft, somewhat yielding body of the female during the act of pairing; hence, during its short life the male, at least, takes no food." The female lays her eggs in midsummer, in white, chalky masses almost an inch wide, on tree-leaves, rocks, timbers, etc., overhanging water, into which the young drop as soon as hatched. These sink to the bottom and grow rapidly into large, slate-gray, tough, predatory larvæ, which hide under stones, etc., in the rapid streams where they most abound, clinging firmly to some support with their anal hooks, while they seize in their jaws such living creatures as come within their reach. They remain in the water two years and eleven months, then creep out upon land, where they wander about at night for a few days, then pupate in some retreat and speedily emerge as adults. The larvæ (dobsons) are regarded as the most satisfactory bait known for still-fishing, and are captured with nets, after overturning stones, etc., and frightening them out into the open water. For the many interesting peculiarities of the structure and economy of this and other species of the Sialidæ (called 'adder-flies' in England), consult: Howard, *The Insect Book* (New York, 1901); Packard, *Standard Natural History*, vol. ii. (Boston, 1884); Miall, *The Natural History of Aquatic Insects* (London, 1895).

COR'YDON. A town and the county-seat of Harrison County, Ind., 108 miles south of Indianapolis, on Indian Creek and on the Louisville, New Albany and Corydon Railroad (Map: Indiana, C 4). It is known as a summer resort, one of its attractions being a sulphur spring. Corydon was the capital of the Territory of Indiana from 1813 to 1816, and of the State of Indiana from 1816 to 1825, when the seat of government was removed to Indianapolis. The Constitutional Convention of 1816 met here. In 1863 the town was the scene of a sharp skirmish between a small force of State militia and a superior force of Confederate raiders under John Morgan. Population, in 1890, 880; in 1900, 1610.

CORYDON. A town and the county-seat of Wayne County, Iowa, 85 miles south by east of Des Moines, on the Keokuk and Western Railroad. The electric-light plant is under municipal control. Population, in 1890, 962; in 1900, 1477.

CORYDON. (1) A shepherd in the Seventh Eclogue of Vergil, and in the *Idyls* of Theocritus, and hence a name conventionally used in literature to designate a country swain, as in Spenser's *Facrie Queene* and *Colin Clout*. (2) A shoemaker in Scott's *Count Robert of Paris*. (3) A musical countryman in Walton's *Complete Angler*, who fraternizes with Piscator.

COR'YLUS. See HAZELNUT.

COR'YMB (from Lat. *corymbus*, from Gk. *κόρυμβος*, *korymbos*, cluster, from *κόρυς*, *korys*, helmet). A flat-topped flower-cluster, in which the pedicels arise at different levels upon an elongated axis, and the outermost flowers bloom first. See INFLORESCENCE.

CORYMBUS (Lat., cluster). That mode of dressing the hair which prevailed among the Greek women and which may be seen in examples of the antique, particularly in the statues representing Venus. This arrangement of the hair was also adopted by the Romans. It con-

sisted in gathering it upward upon the crown and back of the head in one knot. It may be seen in its simplest form in the statue of the Venus de' Medici, in the Uffizi Gallery, Florence.

COR'YPHA. See FAN PALM; GEBANG PALM; TALIPOT PALM.

COR'YPHENE (Lat. *coryphæna*, from Gk. *κορύφαινα*, *koryphaina*, a sort of fish, from *κορυφή*, *koryphē*, summit, but explained by popular etymology as *κόρυς*, *korys*, helmet + *φαίνω*, *phainō*, to appear), or DOLPHIN. One of a genus of fishes (*Coryphæna*) of the family Coryphænidae, to which the name 'dolphin,' properly belonging to the Cetacea, has been popularly transferred. The coryphenes are allied to the opahs, and are remarkable for the beauty and metallic brilliancy of their colors, which delight the spectator as the graceful fish are seen gliding with extreme rapidity near the surface of the water, gleaming in the light; and the changes the colors undergo while the fish is dying have acquired a poetic celebrity. They have an elongated compressed body covered with small scales, the head rising in a sharp crest, the mouth large. They are large fishes, attaining a length of six feet, and are inhabitants of the high seas of warm climates, where they chase the flying-fishes and other surface prey with great speed and voracity. The many described forms are probably all reducible to two or three species. The common, almost cosmopolitan coryphene (*Coryphæna hippurus*) occurs on the coast of the United States as far north as Cape Cod. "They are often caught by sailors at sea, and are considered most excellent food. It is an almost universal custom before eating them to test the flesh by putting a piece of silver into the vessel in which they have been cooked, it being a common belief that if the flesh is poisonous the silver will turn dark" (Goode). See PLATE of HORSE-MACKERELS, ETC.

CORYPH'ODON (Neo-Lat., from Gk. *κορυφή*, *koryphē*, summit + *ὀδούς*, *odous*, tooth). A fossil amblypod mammal of the Lower Eocene beds (Wasatch) of western America, related to *Tinoceras* and the *Uintatheria*. A complete skeleton of *Coryphodon* radians has been found, and is mounted in the American Museum of Natural History in New York City. It shows an animal between five and six feet in length, a size rather large for the Lower Eocene mammals, with large skull, formidable teeth, short neck, rather long body, and short, strong, hinged legs with spreading toes. The brain-cavity is remarkably small. The skeleton indicates a heavy, clumsy animal that lived in the bordering marshes of the Wasatch lakes, feeding on succulent water plants which it uprooted with its spreading front teeth. *Coryphodon* remains have also been found in the Eocene beds of Europe. Consult Osborn, "A Complete Skeleton of *Coryphodon* *Radians*," *Bulletin of the American Museum of Natural History*, vol. x. (New York, 1898). See TERTIARY SYSTEM; TINOCERAS; UINTATHERIUM.

CORY'ZA. See OZENA.

COS (Gk. *Κῶς*, *Kōs*, It. *Stanchio*, Turk. *Istan-köi*). One of the Dorian Sporades, off the southwest coast of Asia Minor, now belonging to Turkey. Cos is about 23 miles long. On the southern side of the island, a range of hills extends along the coast; the western half of the island is also mountainous, but the eastern portion north of the jagged ridge of Mount Prion is

a fertile plain, producing the grapes which furnish the chief modern exports. In ancient times the island was famous for its perfumes, wines, and silk (probably produced from an inferior variety of worm), from which were woven the transparent Coan garments worn by the courtesans of Greece and Rome. There are many mineral springs on the island, which early became an important seat of the worship of Asclepius, the god of healing. Cos was the birthplace of the great physician Hippocrates (q.v.). The chief town, Cos, is situated on the northeast coast, on the site of the ancient city. In the centre of the main street is a gigantic palm-tree, said to have stood there before the Christian Era. To the northwest is an old fortress of the Knights of Saint John. The harbor is small, and so filled with mud as to be available only for small boats. The inhabitants are employed chiefly in agriculture. Cos is mentioned in the *Iliad* among the allies of the Greeks, and the island seems to have been early colonized, perhaps from Thessaly. Later it was the seat of a Dorian colony, apparently from Epidaurus, and became one of the cities of the Dorian Hexapolis. It was a member of the Athenian League, and in the fourth century B.C. enjoyed a prosperity which seems to have increased under Alexander and his successors. It was the birthplace of Ptolemy II. Philadelphus, and the home of Philetas, the bucolic poet, who founded on the island a school of which Theocritus (q.v.) was the most distinguished member. Cos was favored by the Romans, and seems to have been little disturbed till the Latin conquest of Constantinople (A.D. 1204). From that time till its capture by the Turks in 1523, Cos shared the vicissitudes of Rhodes and the neighboring islands. Consult: Rayet, *Mémoire sur l'île de Cos* (1876); Paton and Hicks, *Inscriptions of Cos* (Oxford, 1891), the introduction containing a brief history of the island; Herzog, *Koische Forschungen* (Leipzig, 1899).

CO'SA, JUAN DE LA. See LA COSA, JUAN DE.

COSCIN'OMANCY (from Gk. *κοσκινον*, *koskinon*, sieve + *μαντεία*, *mantēia*, divination). A species of divination, practiced from the earliest times by means of a sieve and a pair of shears or forceps. Tylor (*Primitive Culture*, I. 116) says: "The sieve was held hanging by a thread or by the points of a pair of shears stuck into its rim, and it would turn or swing or fall at the mention of a thief's name and give similar signs for other purposes." The ordeal of the Bible and key is a survival of the old custom. The fiftieth Psalm is read, and when the verse beginning "When thou sawest a thief" is reached, the apparatus is expected to turn toward the culprit. See SUPERSTITION.

COSE/CANT. See TRIGONOMETRY.

COSEGÜINA, *kō'sh-gwē'ná*, or **COSIGÜINA**, *kō'sh-gwē'ná*. A volcano in the extreme western corner of Nicaragua, Central America (Map: Central America, D 4). It is situated on a small peninsula which partly separates the Gulf of Fonseca from the Pacific; it has an altitude of over 3000 feet. During its latest eruption, on January 20, 1835, a shower of ashes fell for three days, and the explosion was heard as far as Mexico.

CO'SEL or **KOSEL**. The capital of a district of Silesia, Prussia, on the river Oder, at the confluence of the Klodnitz, 25 miles southeast of Oppeln. It is a garrison town, has a castle, and was formerly surrounded by walls, the site of which has been converted into boulevards. A fine pyramidal monument commemorates the unsuccessful siege by the French in 1807. The town has considerable trade and numerous domestic industries. It was the capital of a duchy in the fourteenth century. Population, in 1900, 7087.

COSELEY, kōz'li. A manufacturing town in Staffordshire, England, a suburb of Wolverhampton, with which its industries and public works are identified. Population, in 1891, 21,900; in 1901, 22,200.

COSENZ, kō'sānz, ENRICO (1820-98). An Italian soldier, born at Gaeta. He entered the military service of Naples in 1840, participated in the campaign in Upper Italy (1848), and afterwards was prominent in the defense of Venice against the Austrians. In 1859 he became a colonel in the 'Hunters of the Alps,' Garibaldi's corps, and in 1860 took part in the expedition to Sicily. Upon Garibaldi's assumption of the Dictatorship of Naples, he was appointed Minister of War. He commanded a division in the attack on Rome in 1870, and from 1881 until his retirement in 1893 was chief of the General Staff of the Italian Army. He also held civil office as a Deputy from 1860, and Senator from 1872.

COSENZA, kō-sān'zā (Lat. *Cosentia*). The capital of the Province of Cosenza (Calabria Citeriore), in South Italy, situated 120 miles southwest of Taranto (Map: Italy, L 8). It is commanded by a castle, whose walls, nine feet thick, were shattered in the earthquakes of 1783, 1854, and 1870. The older and lower part of the town is very malarious in summer. The cathedral, now being restored according to the discovered ancient plans, contains the tomb of Louis III. of Anjou, who died here in 1435. In the attractive public gardens, near the prefecture and the new theatre, are a figure of Liberty by Giuseppe Paechioni, erected in 1879 to the brothers Bandiera and others who took part in the Calabrian rebellion of 1844, and busts of Garibaldi, Cavour, and Mazzini. There are a seminary, a royal college, a technical school, two academies of science and fine arts, and a chamber of commerce. Cosenza markets silk, oil, wine, manna, hemp, grain, and honey, and manufactures faïence and hardware. Alaric, King of the Visigoths, died here in 410 while on his way to Sicily after the spoliation of Rome. Tradition has it that he and his treasures were buried just below the town in the Busento (ancient Buxentius) where the Crati joins it—a spot now marked by the Ponte Alerico. Population (commune) in 1881, 16,253; in 1901, 21,545.

COSETTE, kōz'ēt'. The adopted daughter of Jean Valjean in Hugo's *Les Misérables*. She is the child of Fantine, and gives her name to the second part of the novel.

COSHOCTON, kō-shōk'ton. A city and the county-seat of Coshocton County, Ohio, 69 miles east by north of Columbus, on the Muskingum River, and on the Pittsburg, Cincinnati, Chicago and Saint Louis, and the Wheeling and Lake Erie railroads (Map: Ohio, G 5). It contains a public library. The city has several novelty-

advertising establishments, machine-shops, wooden novelty works, glass-factory, and other industrial plants. Coshocton was settled in 1811 and incorporated in 1833. The government is administered under a charter of 1901, which provides for a mayor, biennially elected, and a city council. The water-works are owned and operated by the municipality. Population, in 1890, 3672; in 1900, 6473.

COSIMO, kō-zé'mō, PIERO DI. See PIERO DI COSIMO.

COSIMO DE' MEDICI, dā mā'dé-chē. See MEDICI.

COSIN, kūz'n, JOHN (1594-1672). An English prelate. He was born at Norwich and was educated at Cambridge. After holding rectorates at Elwick, Brancepeth, and elsewhere, he assumed charge of Saint Peter's College, Cambridge, in 1635. Three years afterwards he was made vice-chancellor of the university, and in 1640 was appointed Dean of Peterborough. He was chaplain to Charles I. and subsequently joined the royal family in Paris, where for nearly twenty years he conducted religious services in the household of Queen Henrietta. In 1660 he was appointed Bishop of Durham. Although by no means inclined toward Puritanism, he was an inveterate antagonist of Romanism, and during his long residence in France was regarded as the champion of the Protestant cause in that country. Many of the finest prayers in the English Church were written by him, while his other numerous writings are imbued with the force and brilliancy of his interesting personality. He was celebrated for the remarkable frankness with which he defended his views, even under the most unfavorable conditions, and by his splendid administrative ability in the Church. His works include: *Collection of Private Devotions*, prepared at the request of King Charles I. and first published in 1627; *Scholastic History of the Canon of Holy Scripture* (1657); *History of Popish Transubstantiation* (1675); and *Note on the Work of Common Prayers* (1710).

CO'SINE. See TRIGONOMETRY.

COS'MAS (Lat., from Gk. *Kosmās*, *Kosmas*), surnamed INDICOPLEUSTES (i.e. Indian navigator). A merchant of Alexandria, in which city he was probably born, who, after having traveled much in Eastern Asia, including India and Ceylon, returned to Egypt and ended his days in monastic retirement about the middle of the sixth century. While a monk he wrote a *Christian Topography* in 12 volumes, in the Greek language, containing much information about many countries, and particularly about India. An attempt to reconcile everything to his notions of the meaning of the Bible led him into many errors; but though deficient, and even absurd scientifically, as a record of travel and geographical information, the eleventh book, which gives a description of the animals of India and of the Island of Ceylon, takes high rank. His other works have perished. The work (which, among other things, gives the first account of the *Monumentum Adulitanum*—see ADULE) was edited by Montfaucon in the *Nova Collectio Patrum Græcorum*, vol. ii. (Paris, 1707), reprinted by Migne, *Patrol. Græca*, lxxxviii., and translated by Charton in his *Voyageurs* (Paris, 1854).

COSMAS (Lat., from Gk. Κοσμάς, *Kosmas*) and **DA'MIA'NUS** (Lat., from Gk. Δαμιανός). Two Arabian brothers of the third century, Christian martyrs under Diocletian. They practiced physic without fee at Ægea in Cilicia, and, having refused to sacrifice on pagan altars, were beheaded in 303. Their day in the calendar of the Roman Church is September 27. They are honored as the patron saints of physicians and apothecaries. A short-lived order of knights spiritual, named after them, was instituted during the Crusades.

COSMAS OF PRAGUE (c. 1039-1125). A Czech historian, dean of the cathedral at Prague. His works, particularly his *Chronica Boëmorum*, printed in the second volume of the *Fontes Rerum Bohemicarum* (Prague, 1874), constitute a very complete and accurate record of the history of the times.

COSMATI, kôs-mä'té. A family of Roman mediæval artists, named popularly the *Cosmati*, from Cosmas, a prominent member. It was founded about A.D. 1140, by Laurentius, continued by his son Jacobus, his grandson, Cosmas, and a considerable number of other descendants until about 1330, when it dispersed with the departure of the popes for Avignon and the fall of Rome as an artistic centre. The speciality of this school was the use of rich mosaic inlay in geometric patterns in architecture and church interiors and furniture; a style often called *Cosmati work*. But it was not confined to this family, being a style common to all the other family groups of artists of mediæval Rome and its neighborhood, such as the families of Paulus and Vassallectus. The beautiful cloisters of Saint John Lateran and Saint Paul's in Rome are the most familiar of their large works. The choir-seats at San Lorenzo, the tabernacles at Santa Cecilia and Saint Paul's, the pulpits at the Araceli, the tombs at the Minerva and Santa Maria Maggiore, the paschal candlestick at Santa Cecilia, the pavements of these and many other Roman churches, show the versatility and universal use of this style. But most of the finest works are scattered throughout the province, at Civita Castellana, Corneto, Alatri, Anagni, Alba, Ferentino, Terracina, and other cities. The architectural as well as the decorative work was executed by these artists. That the style was Roman is shown by the inscription of 1229 in the charming cloister of Sassovivo in Umbria, where the artist calls it *Roman work*. However, there were two other contemporary Italian schools which produced similar work: that of Campania, with centres at Salerno, Sessa, and Gaeta; and that of Sicily, in the churches of Palermo, Monreale, Cefalù, and others.

Consult: Boito, *Architettura Cosmatesca* (Milan); Frothingham, "Notes on Roman Artists of the Middle Ages" (in early volumes of *American Journal of Archaeology*). G. Clausse has recently published a very full account of this Roman school; see his "Les Cosmati," in *Revue de l'art chrétien*, vol. xlvi. (1897); *Les marbriers romains* (Paris, 1897).

COSMETICS (Gk. κομητικός, *kosmētikos*, skilled in adorning, from κόσμος, *kosmos*, order, world, universe). Preparations used on the skin or hair to beautify or improve their appearance. They include face-powders, such as *bloom*

of almonds and bloom of roses, which impart a red color to the skin; *carmine*, which is used as a rouge for the complexion; *pearl white*, which is a preparation of bismuth, and poisonous; and perfumed starch or chalk. The *kohl* of the Egyptians is supposed to have been a preparation of *stibnite* or antimony sulphide; it is still used by Oriental ladies for painting the eyebrows. Hair-dyes, which are in many cases preparations of lead and perfumes, may also be classed as cosmetics. The great objection to cosmetics, and especially to face-powders, is their tendency to fill up and clog the pores of the skin, and thus prevent free passage of gases and vapors, which is so essential to the preservation of any animal organ in a thorough state of health. See also **PERFUMERY**.

COSMIC DUST (Fr. *cosmique*, Lat. *cosmicus*, Gk. κοσμικός, *kosmikos*, cosmic, from κόσμος, *kosmos*, order, world, universe). Finely divided matter that falls to the earth from extra-terrestrial regions. It is probably similar in nature to meteorites, although much of the dust that reaches the earth's surface from the outer portions of the atmosphere is volcanic. Minute spherules of metallic iron and particles of minerals have been found in the deposits covering the floor of the deep sea, which are ascribed to cosmic origin. Such particles fall all over the earth, but it is only in the deeper ocean basins, remote from land, that they can accumulate in sufficient quantity to be detected.

COSMOG'ONY (Gk. κοσμογονία, *kosmogonia*, from κόσμος, *kosmos*, order, world, universe + γονη, *gonē*, birth, origin). A name used by astronomers to designate theories concerning the origin and development of the solar system, stellar systems, or the universe in general. Many remarkable facts connected with our solar system tend to show that its present condition cannot be the result of a purely accidental action of natural forces. Thus, the orbits of all the important planets are very nearly circular, and are situated nearly in the same plane; the directions of the planets' motions in their orbits are the same for all; all the planets, with the probable exception of Uranus and Neptune, rotate in the same direction on their own axes, and that direction is the same as the direction of their orbital revolutions, etc. Even the planetary satellites share in these peculiarities of the solar system; the planes of their orbital revolutions about the primary planets are always very near the corresponding planes of the planets' own axial rotations, and the directions of the satellites' revolutions also coincide with the directions of the planets' axial rotations.

THE NEBULAR HYPOTHESIS. Kant and Laplace have given us the well-known 'Nebular Hypothesis,' later developed by Sir W. Herschel, to account for the state of affairs existing in the solar system. According to this hypothesis, the material composing the system was originally a mass of intensely hot nebulous or gaseous matter that tended to assume a rotating globular form under the action of gravitational forces. Gradually the mass contracted, and successive rotating rings of matter were from time to time, as it were, left behind. These rings, in turn, broke up, and the matter of each formed a planetary system in which again rings and satellites could form just as in the parent nebular mass.

DARWIN'S HYPOTHESIS. In recent years several new and interesting cosmogonic theories have been elaborated. In 1855 George Howard Darwin showed mathematically that the present condition of our earth and moon (the revolution of the moon and its axial rotation being synchronous) might have been brought about by the action of the tidal friction working continuously through successive ages of cosmic time. Indeed, it is quite reasonable to suppose that, when earth and moon were nearer together, and as yet in a more or less plastic condition, very gigantic tides must have been set up—tides involving the earth's semi-solid matter, as well as the oceans of water and air. Darwin's researches have brought out the fact that such tides must produce important modifications in any system of celestial bodies, and he has been able to explain the origin of many puzzling phenomena in the case of the moon by making use of his fundamental idea of cosmic tidal friction.

THE METEORITIC HYPOTHESIS. Sir Norman Lockyer has recently advocated a cosmogonic theory altogether different from the nebular hypothesis. This is the so-called Meteoritic Hypothesis. It assumes that the stars have been made up by the combining together of masses of meteors (q.v.), space being supposed to contain numberless swarms of those little bodies.

It is not impossible that both the meteoritic and the nebular hypothesis may have had a share in the development of planetary systems. For the meteoritic building up of a nebulous mass may have antedated the contraction of that mass and its transformation into rings and planets in the manner suggested by Laplace. See **NEBULE; SOLAR SYSTEM; SUN;** etc.

ANCIENT COSMOGENIES. Scarcely any people, either ancient or modern, has been without some theory concerning the creation of the world. Passing over the views of such primitive tribes as the Anstralians or American Indians, the cosmogonies of chief interest in connection with our own views are those of Babylonia, India, Iran, Greece, and ancient Germany. The Babylonian system resembles in many respects the cosmogony of the Bible. There was darkness and water, with strange monsters. Into this chaos the god Bel entered, and clove the cosmic sea, and parted the darkness. Animals took the place of the former monsters, and man himself was created, as well as the sun and moon and five planets. In India the story of the creation was more philosophical. In some of the latest hymns of the Rigveda (q.v.), water was the source of all, whence came fire and wind—the breath of divinity. Or, again, the world arose from the sacrifice of Man (Skt. *purusha*), whose head became the sky, his feet the earth, his eye the sun, his breath the wind, while from his mouth, arms, thighs, and feet the four castes sprang. These ideas, developed more fully in the pseudoepical Sanskrit *Purānas* (q.v.), exhibit clearly the pantheistic trend of Hindu thought. The rôle of Kāma or Love in Indian cosmogony bears some resemblance to that of the Greek Eros. Iranian cosmology, as we find it in the *Avesta* and the writings in Pahlavi (q.v.), corresponds to the dualistic character of the Zoroastrian religion. Ormazd, the god of everlasting light, created the good in opposition to Ahriman, the devil, who dwells in eternal darkness. In the course of a

period of three thousand years Ormazd created the heaven, water, earth, plants, animals, and man. In the following three thousand years Ahriman produced evils to combat these creations of Ormazd; but, despite some temporary success, he was finally forced to yield to the powers of good.

Greek cosmogony is more varied. The Homeric poems regard Ocean as the source of the world, while the Hesiodic account ascribes the first beginnings to Chaos. Thales followed the first theory, and Anaximander the second, which has its parallel also in India. Anaximenes considered air to be the source of all, while Heraclitus postulated fire as the primal element, and supposed a constant flux of all things, where only the divine law (Zeus) was immutable. The notion of Eros or Love as a cosmic force was introduced into Greek philosophy by Parmenides and Empedocles, for which Anaxagoras substituted Mind (Gk. *νοῦς*). Of special interest in this connection is the atomic theory of Democritus, according to whose view the world is permeated by a soul which is composed of atoms in continual motion, and which partake of the nature of fire. Later Greek philosophy did hardly anything toward the development of cosmogonic ideas.

For Germanic beliefs on this subject, the most comprehensive source is the *Völuspá*, an Icelandic poem of the twelfth century of our era. Here, however, the Teutonic ideas are strongly influenced by Christianity, and contain, according to the opinion of some scholars, an admixture of Gnostic concepts.

BIBLIOGRAPHY. The cosmogonic ideas of the Egyptians may be found in the studies of Naville. The cosmological views of the American Indian and Eskimo tribes, of the African races, and of the peoples of Farther Asia and the islands of the Eastern seas, may be gathered from the writings of Brinton, Boas, Gill, George Grey, Tylor, and others. The Hindu theories of creation will be found in Hopkins, *Religions of India* (Boston, 1895), and the Persian speculations in Jackson, "Iranische Religion," in Geiger und Kuhn, *Grundriss der iranischen Philologie* (Strassburg, 1900). Consult also: Lukas, *Grundbegriffe in der Kosmogonie der alten Völker* (Leipzig, 1893); Jensen, *Kosmologie der Babylonier* (Strassburg, 1890); Meyer, *Eddische Kosmogonie* (Freiburg, 1891); Faye, *Sur l'origine du monde . . . théories cosmogoniques des anciens et des modernes* (2d ed., Paris, 1885).

COSMOPOLIS (from Gk. *κόσμος*, *kosmos*, order, world, universe + *πόλις*, *polis*, city). A French novel by Paul Bourget (1892). The characters come to Paris from all quarters of the earth, forming an international society. The theme of the action is the persistence of ethnical differences even where a complete cosmopolitanism has apparently been reached.

COSMOPOLITE (Gk. *κοσμοπολίτης*, *cosmopolitēs*, citizen of the world, from *κόσμος*, *kosmos*, order, world, universe + *πολίτης*, *politēs*, citizen, from *πόλις*, *polis*, city). A plant which grows spontaneously in every climate. Not to be confused with ubiquist (q.v.).

COSMORAMA, *kōz'mō-rā'mā* (from Gk. *κόσμος*, *kosmos*, order, world, universe + *ὄραμα*, *horama*, sight, from *ὄρᾶν*, *horan*, to see). An arrangement of lenses and mirrors for viewing pictures, so that they appear as natural as possible.

The name was applied to exhibitions where representations of landscapes, buildings, and other features of places in different parts of the world could be seen. By properly arranging the lenses, mirrors, and illumination, the pictures were produced not only enlarged, but with the effect of perspective. Cosmoramas were first introduced in France at the beginning of the nineteenth century.

COS'MOS (Neo-Lat., from Gk. *κόσμος*, *kosmos*, order, world, universe). A genus of annual and perennial herbs of the order Compositæ. The twenty or so species comprised in this genus are natives of tropical America, mostly Mexico. A few annual species are cultivated in flower-gardens, and have within recent years come into increased prominence and popularity, especially in the United States. (For illustration, see Plate of CRANBERRY, ETC.) The plants are sometimes 10 feet high, leaves pinnately cut, flowers mostly rose, crimson, purple, yellow, or white; generally solitary on a long peduncle. A sandy soil not too rich is preferred. The seeds are sown indoors, and the plants when large enough are set in the garden, after danger of frost is past. *Cosmos bipinnatus* and *Cosmos sulphureus* are the species most commonly grown. The former grows 7 to 10 feet high, blooms in the late fall, and has many different forms. A dwarf variety about 4½ feet high blooms in July. *Cosmos sulphureus* grows 2½ to 4 feet high, with sulphur or rich orange-yellow flowers 1 to ¾ inches in diameter. It comes into blossom in some of the more southern States in late spring, and continues to bloom without cessation until killed by fall frosts. The black cosmos (*Cosmos diversifolius*) is a tender annual growing only 12 to 16 inches high.

COSMOS. A great scientific work in four volumes, by Alexander von Humboldt, which appeared at intervals from 1845 to 1858. It is a physical description of the universe, setting forth physical laws in logical order, though modern science shows it faulty in some of its matter.

COSQUIN, kô'skän', EMMANUEL (1841—). A French writer on folklore. He was born at Vitry-le-François, Marne. In his *Contes populaires de Lorraine* (1887) he aims to show that the folklore of Europe has been derived from India. He has also written considerably on religious subjects, chiefly for the paper *Le Français*, and prepared the following French translation of the works of Fessler, secretary of the Vatican Council: *La vraie et la fausse infallibilité des Papes* (1873) and *Le concile du Vatican* (1877).

COSS. See ALGEBRA.

COS'SA, FRANCESCO (c.1438-c.80). An Italian painter. He worked at Ferrara and Bologna, and is considered, with Lorenzo Costa, to have been the founder of the Ferrarese School. In the Palazzo Schifanoja at Ferrara there is a curious fresco by him, "The Glorification of March, April, and May," the other months having been done by lesser artists. In this composition there are a number of portraits of his contemporaries, remarkable for their fidelity to nature and for the valuable studies of costume. The Marquis of Borso, for whom the picture was painted, gave Cossa but slight compensation, and he, indignant at this treatment, left Ferrara and settled at Bologna. His picture in the

gallery there—a Madonna surrounded by saints—is considered his finest work.

COSSA, LUIGI (1831-96). An Italian economist. He was born in Milan, studied at the universities of Pavia, Vienna, and Leipzig, and in 1858 was appointed professor of political economy in Pavia. His most important work is the *Primi elementi di economia politica* (8th ed., 1889), which has been translated into English and several other languages. Among his other publications may be mentioned *Saggi di economia politica* (1878).

COSSA, PIETRO (1834-81). An Italian dramatist, born in Rome. He is considered the most brilliant writer for the stage that the nineteenth century produced in Italy after the death of the Count Giraud. The best of his plays are the following: *Neroni* (1871); *Plauto* (1876); *Cola di Rienzi*; *Giuliano l'Apostata* (1876); *Messalina* (1876); *I Borgia* (1878); and *Clcopatra* (1879). "If not great plays or dramatic poems," says an eminent critic, "they are, at all events, very splendid historical masquerades." A collection of them, *Teatro poetico*, was published (Turin, 1887).

COSSACK ASPARAGUS. See ΤΥΡΗΑ.

COSSACK POSTS. A system of outposts, used in the United States Army. Each post consists of four men—three reliefs of one sentinel each and a non-commissioned officer as commander, or, failing such, an old and experienced soldier. They are a substitute for the usual line of pickets and sentinels. From four to twelve such posts are supplied from each support; and in close rugged country they are posted about 300 yards in front of them, and are usually 150 to 300 yards apart from each other. The sentinels are posted from 10 to 30 yards in front of the Cossack posts and are kept under constant observation by the other members of their post. They are relieved every hour, and the posts every three hours. The advantages claimed for the Cossack system are that it is more economical in point of men required than is the usual method, and is besides less fatiguing, and consequently more effective; and that, above all else, it enables the sentries to be more resolute in the performance of their duties, because, backed up by the nearness of their post, they are freed from any timidity of loneliness. See OUTPOST.

COSSACKS (Russ. *kozakü*, *kazakü*, from Turk. *kazäk*, robber; the same word in Tatar designating a light-armed warrior). A name borne by a people living under a peculiar military organization, who for several centuries have constituted an important element in the population of southern Russia. Their principal homes are the steppes of the Don and of Ciscaucasia and a region at the southern end of the Ural Mountains, on the borders of European Russia and Siberia. They are a mixed race, of Russian, Polish, Tatar, and other elements, with the Russian predominating. In fact, they are distinguished from the other Russians by their unsettled mode of life rather than by any difference of race or fundamental character. The Cossacks make their appearance in history about the close of the Middle Ages as a frontier people, on the border of Slavdom (Russia and Poland) on the one hand and the Tatar regions to the southeast on the other. A free, wild people.

accustomed to live in the saddle and in constant warfare, they acquired by inheritance the qualities of courage, endurance, self-reliance, and good horsemanship, which gave them high rank among the irregular cavalry of the world. Long unaccustomed to the restraints of civilized government, they distinguished themselves by their predatory habits. The Don Cossacks, who at the present time constitute the principal body of the Cossacks, became powerful about the close of the sixteenth century. The town of Tcherkask became the seat of their government. At the head of their democratic organization was the Ataman (Hetman). In 1773 the Don Cossacks joined the pretender Pugatcheff against Catharine II., for which they were chastised by being deprived of all of their liberties and their democratic institutions. Yermak Timofeyeff, a Don Cossack, belonging to a lawless band, the Good Companions of the Don, entered the service of the Stroganoffs, a wealthy family living in the Ural region and holding special trading privileges, crossed the Urals with a few hundred followers in 1581, and in a few years conquered and brought into a rude kind of subjection all of western Siberia. From this time the history of the Cossacks is closely connected with that of the Russian progress eastward through Siberia. With wonderful persistence and endurance, and a spirit of enterprise that would have been impossible in the stolid Russian village peasant, they explored and subdued this vast addition to Russia's territory. The Malorussian (Little Russian) Cossacks, or Cossacks of the Ukraine (Border Land), were organized in the second half of the sixteenth century by Stephen Báthory, King of Poland, into a defensive bulwark on the southeastern frontiers of the realm. In the middle of the seventeenth century, harassed by Polish oppression, they revolted under the lead of their Ataman, Chmielnicki (q.v.), and placed themselves under the protection of Russia. Under the lead of Mazeppa they joined Charles XII. against Peter the Great, whose victory at Poltava sealed their fate. Their liberties were abolished and they were treated with great harshness. The Zaporogian Cossacks (Russ. *Zaporog*, beyond the rapids), on the Dnieper, were one of the most notable of the tribes down to the middle of the seventeenth century, when they submitted to Russia. Their predatory incursions were not confined to the land, but included naval expeditions against the Turkish towns of Asia Minor. Among their peculiar tribal institutions was the celibacy imposed upon the ruling class.

The Cossacks are regarded by the Russian Government as a military division of the population. They are organized in eleven *voiskos* or *corps* (Don, Kuban, Terek, Astrakhan, Orenburg, Ural, Siberia, Semiryetchensk, Transbaikalia, Amur, Usuri). Their military training begins in boyhood; compulsory service in the *stanitsa*, or Cossack post, begins at seventeen; field service begins at twenty, and continues from twenty to twenty-five years. This service is divided into three classes—active, on furlough with arms and horses, and on furlough with arms but without horses. Each *voisko* equips and clothes its soldiers, and receives an allowance of land from the Crown. The Cossacks wear a distinctive uniform of dark green. Part of them, in addition to other arms, still carry a long lance. The Kuban

voisko enrolls 6 battalions of Cossack infantry, and there are also fifteen batteries (4½ on a war footing) of Cossack field artillery. The title of Ataman, or chief of the Cossacks, is now vested in the Imperial family. The Cossacks probably number between 1,500,000 and 2,000,000.

Consult: Erekert, *Der Ursprung der Kosaken* (Berlin, 1882); Tettau, *Die Kosakenheere* (ib., 1892); Wallace, *Russia* (9th ed., London, 1883); Krasinski, *The Cossacks of the Ukraine* (ib., 1848); Vladimir, *Russia on the Pacific* (ib., 1899). A splendid realistic picture of Cossack life may be found in Gogol's celebrated novel *Taras Bulba*.

COSSACKS, THE. A novel by Count Tolstoy (1852). It was translated into English in 1878.

COSSON, kō'sōn', ERNEST (1819-89). A French botanist, born in Paris. He carried on extensive botanical studies in Algeria and explored the flora in the suburbs of Paris. His published works include the following: *Flore descriptive et analytique des environs de Paris*, jointly with Saint-Pierre (1845); *Synopsis analytique de la flore des environs de Paris* (1845); *Atlas de la flore des environs de Paris* (1842); *Compendium Floræ Atlanticæ ou Flore des états barbaresques: Algérie, Tunisie, Maroc* (1881-87); *Conspectus Floræ Atlanticæ* (1881); and *Illustrationes Floræ Atlanticæ* (1883-92).

COSSUTIUS, kōs-sū'shī-ūs. A Roman architect noted for his selection by King Antiochus Epiphanes (B.C. 175-164) to rebuild the great temple of the Olympian Zeus at Athens in the Corinthian style.

COSTA, kō'stā, CLAUDIO MANUEL da (1729-89). A Brazilian poet. He was born at Mariamo (Province of Minas-Geraes). His works, which are numerous, are highly valued by the Portuguese, who consider them classics. The best of them is *Villarica* (1839-41).

COSTA, ISAAC DA. See DA COSTA, ISAAC.

COSTA, LORENZO (1460-1535). An Italian painter, born in Ferrara. He was a pupil of Cosimo Tura and Ercole Roberti in Ferrara, and perhaps of Francesco Cossa. Vasari says he also studied the works of Gozzoli and Lippi in Florence. After his return to Ferrara he painted several works now destroyed. In 1483 he went to Bologna, where he remained almost constantly until the fall of his patrons, the Bentivoglio family, in 1506, and there he began his connection with Francia. The artists had a joint school, and worked as co-painters. Costa first influenced Francia, but afterwards it was the other way. As a colorist Costa is inferior to Francia. Many of his best paintings are in the Bolognese churches. Among those may be mentioned: "A Madonna with Members of the Bentivoglio Family" (1488) in San Giacomo Maggiore, a characteristic example, admirable in its fresh, simple, sincere treatment and masterly drawing; "The Triumph of Life and Death," and frescoes, in the same church; an "Annunciation" and "Madonna" (1492) in San Petronio; and frescoes in Santa Cecilia. After he left Bologna he went to Mantua, where he lived until his death. Later works include the "Court of Isabella d'Este" (in the Louvre) and the "Dead Christ" (1504, Berlin Museum); they are rare outside Italy. Dosso, Garofalo, and others car-

ried on the traditions of the Ferrarese School, of which many consider Lorenzo Costa the founder.

Consult: Morelli, *Italian Painters: Critical Studies of Their Works*, translated by Constance Jocelyn Ffoulkes (London, 1892-93); Vasari, *Lives of the Painters*, translated by Blashfield (New York, 1897); Crowe and Cavalcaselle, *History of Painting in North Italy* (London, 1871).

COSTA, Sir MICHAEL, really MICHELE (1810-84). An Italian composer and conductor, born in Naples. He was taught by his father and Zingarelli (q.v.). When the latter's psalm was to be performed at the Birmingham Festival (1828), he sent Costa, then only eighteen years old, to conduct it. Owing to a misunderstanding, Costa had, instead, to sing the tenor part, but acquitted himself of the task brilliantly, and his reception induced him to settle in England. He became conductor of Italian opera in 1830, and in 1847 assumed the same post in the Covent Garden Opera. In addition he was appointed conductor of the Philharmonic Society (1846); Sacred Harmonic Society (1848); Birmingham Festivals (1849); and Handel Festivals (1857). His principal work, the oratorio *Eli*, was successfully produced at the Birmingham Festival of 1855 and *Naaman* in 1864. In 1869 he was knighted by Queen Victoria and also received the royal order of Frederick from the King of Württemberg. Costa wrote several ballets and operas, of which the most successful were *Don Carlos* and *Malck Adel*. He died at Brighton, England.

COSTA, PAOLO (1771-1836). An Italian author, born in Ravenna. He was educated in Padua, and was a teacher successively in Treviso, Bologna, and Corfu. His treatise on the *Divina Commedia* (1819) did much to popularize Dante in Italy. He collaborated with Orioli and Cardinali in a revision (1819-28) of the *Vocabolario* (1612) of the Accademia della Crusca, and with Giovanni Macchetti, translated into Italian Homer's *Batrachomyomachia*, and Schiller's *Don Carlos*. His collected works, with a sketch by Becchi, appeared in Florence in 1839-40 (4 vols.). Consult, also, the biography by Mordani (Forlì, 1840).

COSTA CABRAL, kó'stá ká-brál', ANTONIO BERNARDO DA, Count de Thomar (1803-89). A Portuguese statesman. He became judge of the Supreme Court in Oporto and in Lisbon, and in 1835 was elected to the Chamber of Deputies, where at first he was one of the leaders of the Radicals, but soon joined the Conservative Party. He was appointed Governor of Lisbon in 1838 and Minister of Justice in 1839. For the purpose of setting aside the Constitution of 1820 with its restrictions of the royal power, he fomented, in 1842, an insurrection in Oporto, assumed control of the army, established a censorship of the public schools, suppressed the universities, and so oppressed the people with taxes that he was driven from power in 1846. Once more appointed Prime Minister, in 1849, he again played the dictator, to the detriment, especially, of the State finances, but was compelled to resign. The Queen refused to accept his resignation, and a revolution was started against him under the leadership of Saldanha, which overthrew his administration in April, 1851. He fled to England, but returned the next year, and from 1859 to 1861 was Minister to Brazil. In 1862 he became a member of the Council of

State and president of the Superior Administrative Court.

COSTA RICA, kó'stá rē'ká (Sp., rich coast). The most southern of the Central American States, bounded by Nicaragua on the north, the Caribbean Sea on the east, Colombia (Panama) on the southeast, and the Pacific on the southwest (Map: Central America, E 5). Its area, after the adjustment of the boundary disputes with Nicaragua and Colombia, is estimated at about 21,500 square miles. Lake Nicaragua forms part of the northern boundary.

TOPOGRAPHY. The interior of the country is taken up partly by the Talamanca range of mountains (a continuation of the Cordillera of Chiriquí), which runs from the southeast to the northwest as far as latitude 10° N. The Talamanca is of volcanic origin and reaches in its highest peaks an altitude of over 12,700 feet. North of the Cartago highland commences the second mountain range, which extends in the same (northwesterly) direction to the northern boundary of the Republic. There are several volcanoes in this range. Of them, however, but two—the Irazú (11,500 feet) and Turrialba (11,350 feet)—show any signs of activity. Since 1841, when the town of Cartago was almost completely destroyed, no serious eruption has occurred. The Atlantic coast, which, according to the adjustment of the southern boundary in 1900, reaches only to a point a little north of the mouth of the river Teliri or Siesola, is generally low, and, with the exception of Port Limón, without any inlet. The Pacific coast, on the contrary, has a more elevated surface and forms the two spacious gulfs of Nicoya and Dulce, which are protected by two mountainous peninsulas. There are a number of smaller inlets in the northern part. The rivers of Costa Rica are short, and, although abundant in water, unnavigable. Most of them flow into the Atlantic or the Pacific, while some join the San Juan, which forms the eastern half of the northern boundary.

GEOLOGY. The interior highland region is composed of Paleozoic and Mesozoic strata, in places broken through by ancient eruptives and overlain by more recent lava-flows. Many districts are known to be mineralized; the deposits of gold are especially important and have attracted the attention of foreign capitalists, who are now engaged in developing this branch of the mining industry. The eastern coast of Costa Rica is an alluvial plain.

CLIMATE. In regard to its climate, Costa Rica may be divided into three zones. The torrid zone, below 3000 feet, comprising the coastlands, has an average temperature ranging from 72° to 82° F. The temperate zone, lying between 3000 and 7500 feet, has the most salubrious climate and a mean temperature ranging from 57° to 68°. Above 7500 feet the temperature is much lower and frosts are frequent, but snows rare. On the tablelands of San José, lying at an elevation of 3000 to 4000 feet, the climate is very agreeable, the temperature having a range of only about 5°, the mean for the year being 67°. The dry season lasts from December to May, while the months of December, January, and February are the coldest of the year. Owing to the proximity of the two oceans, winds blow almost continually, and occasion considerable discomfort during the dry season. On the whole, the climate of Costa

Rica is healthful and fevers occur only in regions below an elevation of 150 feet.

FLORA AND FAUNA. The vegetation and animal life are characteristic of Central America generally, which forms a part of the Neotropical region.

AGRICULTURE. Costa Rica is essentially an agricultural country, and is chiefly dependent on the cultivation of coffee. Notwithstanding the sparse population of the country and the lack of transportation facilities, agriculture is in a flourishing condition, as evidenced by the constantly increasing exports of agricultural products. This state of affairs is due partly to the fertility of the soil and favorable climatic conditions, and particularly to the fact that the larger part of the land is held by the State, which rents or sells it in small tracts on very advantageous terms, in some cases distributing it gratuitously, in lots not exceeding 500 hectares (1235 acres). As a result of this policy almost every inhabitant of Costa Rica is a landholder. The cultivation of coffee has been steadily increasing and will undoubtedly show a greater growth in the future, as a result of the law passed in 1901 abolishing the export duty on that article. According to the census of 1892, there were in Costa Rica 8366 coffee plantations, with an annual output of over 38,000,000 pounds. In 1894, 23,129,000 pounds of coffee were exported; in 1898, over 43,000,000 pounds; in 1901, over 36,000,000 pounds. Next to coffee, bananas form the most important agricultural product. The development of banana-growing has also been rapid, as seen from the export figures. Thus in 1881 there were exported only about 3500 bunches; by 1890 the exports increased to 1,034,765 bunches; while in 1901 they amounted to 3,870,000 bunches. Besides coffee and bananas, there are raised sugar, cacao, rice, and corn, but none of them is exported to any extent. Stock-raising is carried on quite extensively, and the forests are exploited on a steadily increasing scale.

MANUFACTURES. Of manufacturing establishments Costa Rica has very few, the largest being the national liquor factory and the national foundry at San José. The country is behind the neighboring States in manufacturing.

TRANSPORTATION AND COMMUNICATION. The Isthmian railway line has been in construction for over twenty years, and in 1900 only twenty-one miles were lacking to connect Port Limón on the Atlantic with Tivives on the Gulf of Nicoya, where a port is to be constructed. The line is being built by an English corporation, and in 1900 had a total length of 137 miles, reaching as far as Alajuela. A branch line toward Lake Nicaragua is also in process of construction. The telegraph lines of Costa Rica have over 900 miles of wire.

COMMERCE. In 1900 Costa Rica owned three small merchant steamers and two sailing vessels. The two main ports are visited regularly by eight lines of steamers—American, Chilean, and European. The annual value of the commerce exceeds \$12,400,000, the exports only slightly exceeding the imports. The exports for 1900 (not including gold coin) amounted to \$6,000,000, of which coffee contributed \$3,800,187; bananas, \$1,354,385; woods, \$382,000; gold and silver in bars, over \$240,000; and hides, rubber,

skins, etc., the remainder. The imports for the same year amounted to about \$6,000,000, and were distributed largely between the United States, England, Germany, and France, in the order named. The imports from the United States show an increase from about 33 per cent. in 1896 to over 46 per cent. in 1900. The imports of the other three countries show a decrease during the same period. The chief ports are Punta Arenas on the Pacific, and Port Limón on the Atlantic, whose combined shipping exceeded, in 1900, 700,000 tons. The annual imports of merchandise from the United States into Costa Rica for the period of 1891-1900 averaged \$1,246,000; the exports from Costa Rica to the United States during the same period averaged \$2,907,960. The United States takes almost the entire crop of bananas and a considerable portion of the coffee. In 1901 the import duties were increased 50 per cent., while the export duties on coffee and the import duties on machinery were abolished. Considering the area and population of the country, Costa Rica compares favorably in its economic condition with most of the Central and South American countries. The comparative freedom from political disturbances and the favorable climatic conditions have attracted foreign capital and immigration, factors which have figured prominently in the development of the country.

GOVERNMENT. In its form of government, Costa Rica is a republic. It is governed under a constitution adopted in 1871; but this was not wholly in force until 1882. The executive power is vested in the President, elected indirectly for four years, assisted by a Cabinet of four members. The Congress consists only of a Chamber of Representatives, elected indirectly for four years at the rate of one representative to every 8000 inhabitants. For administrative purposes the Republic is divided into five provinces and two comarcas, administered by governors appointed by the President. Justice is administered by a supreme court, two courts of appeals, a court of cassation, and also provincial courts. Capital punishment is prohibited. To guard the public health, the country is divided into twenty-one districts, which are in charge of physicians paid by the Government. The Constitution provides for compulsory military service in time of war. On a peace footing the standing army numbers 600 men and the militia about 12,000. The Government owns one gunboat and one torpedo-boat.

FINANCE. The revenue is obtained primarily from customs and excise. The budget at present exceeds \$4,000,000. The foreign debt of the Republic has been greatly augmented by the non-payment of interest, and the Government has repeatedly gone into default. By the terms of the latest arrangement with the creditors in 1897 the Government obtained a reduction of interest and agreed to pay up the debt at the rate of £10,000 (\$50,000) per annum, beginning in 1917. In 1901 the foreign debt amounted to \$10,129,600; the internal debt in 1900 was \$3,215,973. The metric system is legally established in the country, but Spanish weights and measures are generally used.

BANKS. The two banks of Costa Rica have a combined capital of about \$3,200,000. In 1900 there were 3,000,000 paper pesos in circulation, exchangeable for gold. The metallic money of the

country then amounted to 6,000,000 colones, five-sixths being gold, the rest being silver coin of the Republic. In that year a new coinage was put in circulation, based on an act passed in 1896, adopting a gold standard at 26 $\frac{2}{3}$ % to 1, and making the colon (worth \$0.465) the monetary unit. Under this law all debts contracted in national money are payable in the new coin, on the basis of 1 colon to a silver peso. Foreign silver is not legal.

POPULATION. The population of Costa Rica, as given by the census of 1892, was 243,205, but the actual population, including about 4000 aborigines, was supposed to be over 260,000. In 1899 it was estimated at 310,000. The foreign population exceeds 6000, and consists mostly of immigrants from Spain and Germany. The natives are in the main descendants of Spanish colonists from Galicia, and by their industry and peaceful disposition present a favorable contrast to their neighbors in South and Central America. The capital is San José (q.v.).

Costa Rica leads the Central American States in education. Public instruction is free and is enforced. There are several institutions of higher education, and three important public libraries. The majority of the population, however, are illiterate. The Roman Catholic Church is recognized and supported by the State, but other religions are tolerated.

HISTORY. Costa Rica was first visited, and probably named, by Columbus in 1502, and settled permanently about 1530. It formed a part of the Audiencia and Captain-Generaley of Guatemala till 1821. With other Central American States, Costa Rica was a part of Mexico till 1823, when the proclamation of a Mexican republic caused them to withdraw from a connection which had always been distasteful and which in effect had been merely nominal. A federal republic of the seceding States was first tried. It lasted until 1839, but its authority does not seem to have extended over the Costa Ricans, who busied themselves with commerce and took little interest in public matters. Affairs remained in an unsettled condition, however, and Costa Rica's exact status was not definitely determined until 1848, when she successfully declared herself an independent republic. In 1856 Costa Rica was involved in war against the filibuster William Walker (q.v.). The country has been freer from revolution than its neighbors. The present Constitution dates from 1871. In 1897 Costa Rica became a member of the short-lived Greater Republic of Central America, established in 1895 by Honduras, Nicaragua, and Salvador for the purpose of common defense and the harmonious adjustment of foreign relations. Within the last half-dozen years nothing more serious than boundary disputes has disturbed the Government of Costa Rica. The most important of these, with Colombia, was adjuted in 1900, in favor of Costa Rica. Besides the general works on Central America, of which Squier, *States of Central America* (New York, 1858), is the best, and Baneroff, *Central America*, vol. iii. (San Francisco, 1890), is the most copious, consult the English translation of Calvo, *Republic of Costa Rica* (Chicago, 1890). This is a popular and patriotic work, authorized by the Costa Rican Government, and gives the version of political

and commercial events most acceptable to the men in power in 1890.

Consult: Barrantes, *Geografía de Costa Rica* (Barcelona, 1892); Villafraña, *Costa Rica, the Gem of American Republics: The Land, Its Resources and Its People* (New York, 1895); Church, "Costa Rica," in *Geographical Journal*, vol. x. (London, 1897); Biolley, *Costa Rica and Her Future* (Washington, 1889); Schroeder, *Costa Rica State Immigration* (San José, 1894).

COSTE, kôst, JEAN VICTOR (1807-73). A French naturalist, noted for researches in embryology and for efforts toward the cultivation of fishes in his country. In 1841 he became professor of embryogeny at the Collège de France. Mainly through his influence, 600,000 salmon and trout were placed in the Rhone. In 1862 he was appointed inspector-general of the river and coast fisheries. He published *Embryogénie comparée* (1837); *Instructions pratiques sur la pisciculture* (1853); and *Voyage d'exploration sur le littoral de la France et de l'Italie* (1855).

COSTEANING (kôs-tên'ing) DITCH (from *costean*, from Corn. *cothas*, dropped + *stean*, tin, Welsh *ystaen*, Gael. *staoin*, Manx *stainny*, Lat. *stannum*, tin). A ditch dug with the object of encountering the outcrop of a mineral deposit, the presence of which is suspected. Sometimes a series of ditches is dug to determine the direction of the line of outcrop.

COSTEL'LO, LOUISA STUART (1799-1870). An English author and miniature painter. For a time she occupied herself entirely with painting, but having attracted the attention of Scott and Moore, she adopted literature as her profession and produced many works which attained popularity. Some of them are: *Songs of a Stranger* (1825); *The Maid of the Cypress Isle and Other Poems* (1815); *Specimens of the Early Poetry of France* (1835); *A Summer Among the Bocages and Vines* (1840); and a number of semi-historical novels, of which the most prominent are: *Memoirs of Mary, the Young Duchess of Burgundy* (1853), and *Memoirs of Anne, Duchess of Brittany* (1855).

COSTER, kôs'tēr, LAURENS JANSZON. A native of Haarlem, Holland, reputed inventor of printing (about 1440). He is said to have printed sentences from beech-bark blocks, to have discovered a suitable ink, and to have substituted types of lead and later of pewter for beech-wood. As he is alleged to have endeavored to counterfeit manuscript, he is supposed to have worked in secret, but to have taken apprentices, one of whom, Johann Günsfleisch, a member of the Gutenberg family, is said on Coster's death to have stolen types and matrices and fled to Mainz, where he might have revealed the secret to Gutenberg (q.v.). Coster's claim, vigorously maintained by many Dutch scholars, was disproved by Van der Linde (1870), who showed that Coster was a tallow-chandler and tavern-keeper, that he was confused with Laurens Janszoon, a wine-merchant and town officer, and that the claim for him as inventor was first made by Gerrit Thomaszoon in 1550. Consult Morley, *English Writers*, vol. vi. (London, 1890).

COSTER, SAMUEL. See KOSTER, SAMUEL.

COST'IGAN, CAPTAIN. A retired shabby-genteel Irish officer in Thackeray's *Pendennis*, whose sense of family dignity is second only to

his affection for whisky. He is the father of 'the Fotheringay.'

COSTIGAN, EMLY. 'The Fotheringay,' in Thackeray's *Pendennis*. She is the early sweet-heart of Arthur Pendennis, who is rescued from marriage with her only by the prompt action of his worldly-wise old uncle, the Major, ably seconded by Foker.

COSTIGAN, JOHN (1835—). A Canadian statesman. He was born at Saint Nicholas, Quebec Province; was educated at Saint Anne's College, and subsequently became a judge of the inferior common pleas court. He sat for Victoria in the New Brunswick Legislature from 1861 to 1866, and after the union of 1867 was elected by the same constituency to the Dominion House of Commons, of which he is still a member. In 1882-92 he was Minister of Inland Revenue, from 1892 to 1894 was Secretary of State, and afterwards was Minister of Marine and Fisheries.

COST-MARY (from *cost*, Lat. *costum*, an Oriental aromatic plant, from Gk. *κόστος*, *kostos*, spice-root + *-mary*, Fr. *marine*, Lat. *marinus*, pertaining to the sea, from *mare*, sea, but confused by popular etymology with *Mary*). The rayless form of *Chrysanthemum balsamita*, a perennial plant of the natural order Composite, a native of western Asia, long cultivated in gardens for the agreeable fragrance of the leaves. The root-leaves are ovate, of a grayish color, on long footstalks; the stem is two to three feet high; it has small heads of flowers in loose corymbs, deep yellow.

COSTS (from *cost*, OF. *cofter*, *couster*, Fr. *coûter*, ML. *costare*, to cost, from Lat. *constare*, to cost, stand together, from *com-*, together + *stare*, Gk. *στάνα*, *histanai*, Skt. *sthā*, to stand). In a litigated case, the sum of money which the successful party is allowed to recover from his opponent, as a partial compensation for the expenses of the litigation. In actions at common law, costs are the creation of statute; but in equity and admiralty suits they are fixed by the court, except where this power has been taken away or modified by legislation. Even in common-law actions, discretion is often vested in the court to grant an allowance to the prevailing party in addition to the ordinary costs; and in some jurisdictions paupers and seamen may be relieved from costs altogether.

Costs are either: (a) *interlocutory*, that is, such as are awarded upon motions or similar proceedings during the pendency of the action; or (b) *final*, that is, such as follow upon the determination of the action. Upon the decision of a motion, or upon a judgment on appeal reversing the judgment appealed from and awarding a new trial, costs are often ordered to *abide the event*. In such a case, if the final judgment is in favor of the party who succeeded on the motion or appeal, he gets his costs of those proceedings, otherwise he loses them.

The *taxation of costs* is the official adjustment, on notice, of the various items to which the successful party is entitled. For details relating to costs, consult the authorities referred to under PRACTICE.

COSTUME (Fr. *costume*, ML. *costuma*, costume, from Lat. *consuetudo*, custom, from *consuescere*, inchoative of *consuere*, to be accustomed, from *com-*, together + *suere*, to be accustomed,

probably connected with *suus*, own). Both dress and costume are concerned with what men and women have worn, in all epochs and under civilizations of all degrees; but dress (q.v.) deals with preserving the natural heat of the body, or protecting it from the sun or from rain, and with the requirements of that conventional propriety which varies so much in different lands and with different conditions; while costume has to do with appliances used to give to the person stateliness or grace, or an effective show of forms and colors, as well as with the strictly regulated ceremonial dress assumed by dignitaries or officials; but the description of these exceptional forms of costume cannot be included in this article. See e.g. CORONET; CROWN; and the article on various forms of knighthood.

Costume, as a matter of display, or at least of decorative effect, consists partly in the use of textile fabrics which are beautiful in themselves, or substitutes for them made of bark or leather, and decorated by printing or stamping; partly in the shaping and adjusting of the garments made of these decorative stuffs. Cognate subjects are the arrangements of jewels attached to the dress or hung upon the body, and the care of the hair, skin, and beard. See JEWELRY; HAIR-DRESSING; HAIR-POWDER; etc.

To judge from the artistic remains of ancient Egypt and Assyria, the use of rich stuffs was the primary thought of the Egyptians, who sought to be splendid in appearance. Beauty of material and of pattern at least held an even place in their minds with jewelry. Thus, from the earliest era known to us by the painted monuments down to a period later than the Macedonian conquest, the little-changing adornment of the Egyptian official or Court lady was something very magnificent indeed, in the way of broad necklaces made up apparently of ring within ring of carved gems, mounted in gold with exquisite handling and taste, and covering the shoulders and the junction of the throat with the breast, as completely as the steel gorget of the sixteenth century. The full significance of these collars is not entirely certain. It may be that in some cases the jewelry was sewn upon a collar-shaped piece of stuff, which has fallen away from those jewels which are found in the ancient tombs. Armlets worn on the upper arm and also on the wrist, like the modern bracelet, are as common as the necklaces, and there are evidences of a jeweled girdle as rich and as broad as the combination of necklaces, although this, being worn, as the necklaces are, directly upon the skin, is only in part seen, being often covered by the folds of the skirt, which is sometimes secured to the belt and falls below it. The stuffs themselves are found of still greater splendor in the representations of upholstered furniture; but this appears to be in part because a larger surface could be presented there than in the garment worn by man or woman. The patterns are so similar to the earlier painted designs of the tomb interiors that there becomes evident a close connection in the mind of the Egyptian designer between one surface and another, the beautifying of which was to be intrusted to color. There are, however, stuffs of the eighteenth dynasty, and perhaps earlier, usually of linen, which have been found in a more or less fragmentary condition in the tombs, and many of these are of the most ex-

quisite beauty, equaling in the perfect intelligence of the design adapted to textile fabrics the finest work of the Byzantines or Persians two thousand years later. In the warm climate of Egypt the clothes even of persons of rank were very slight, and rather for ceremonial purposes than for utility. In the Assyrian monuments, on the other hand, there is a marked tendency toward covering the whole person with what seem to be heavy draperies, whereas in the Egyptian bas-reliefs the lines of the body are often made visible through the opening which represents the outer garments, suggesting either a partly transparent material or at least a material so little adjusted to the person and so slight that the body itself was never forgotten. The monuments of the Assyrian tombs, on the contrary, show wrappings apparently opaque and stiff. It is evident, however, that embroidery was much used; for parts of the garments, as of a king, are sculptured in low relief upon relief, and in a way which resembles closely the representation of the embroideries upon priestly robes in the sculpture of the Italian Renaissance. As for jewelry, it was as rich and splendid in Assyria as in Egypt, though the forms differ.

Among the peoples of western Asia even partial nudity was considered dishonorable, or at least the badge of inferiority. Accordingly, the heavy garments shown in the works of art of Mesopotamia are easy of explanation, for where only slaves are wholly or partially naked, the tendency is strong toward the association of high rank with complete clothing. But then another tendency appears, that of making the garments of plainer stuff when the body is covered by them from shoulders to ankles, and using the richer stuffs, as above explained, for borders and the like. The Egyptian, with body, arms, and feet bare, might make his kilt of the most splendid piece of weaving obtainable, but the Assyrian, using yards of material for his garment, would naturally employ a simpler stuff: not to avoid expense, but because people of such refined taste as those of Mesopotamia would shun the use of large surfaces, of uniform patterns, or the contrast, side by side, of differing patterns, of about equal size and brilliancy.

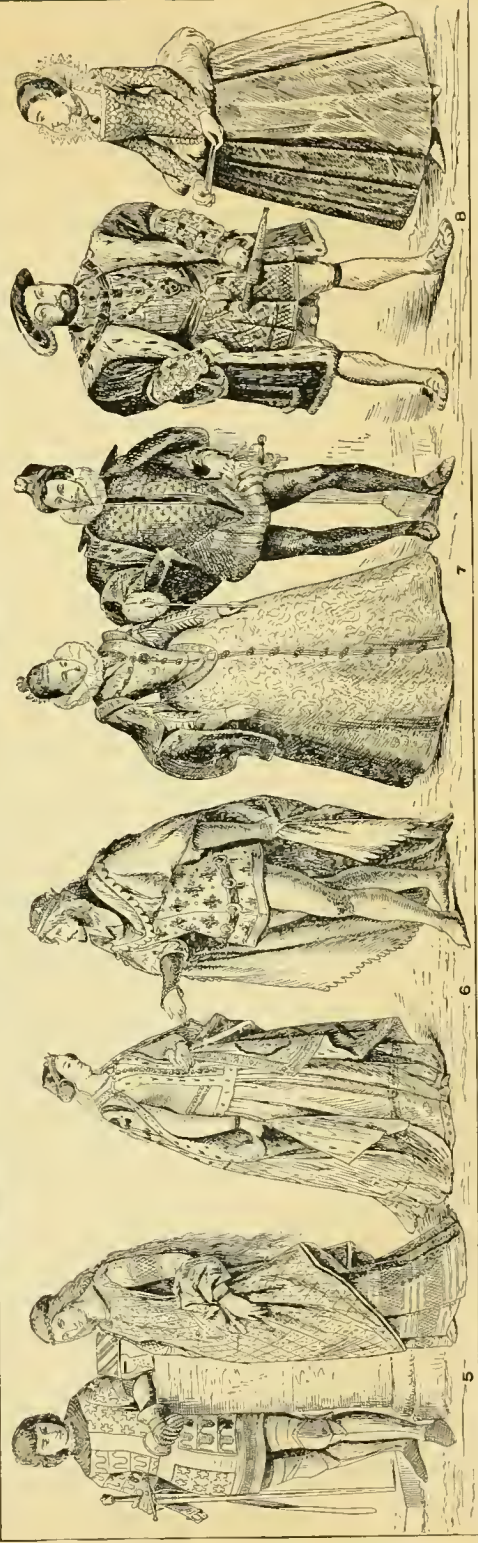
This tendency is not maintained, however, in that other ancient civilization in a sense equal in antiquity as in importance to the civilization of western Asia. The Chinese, from the oldest times of which we have any knowledge, have been among the greatest artists in textile fabrics, as in other industrial arts, and history does not tell us of the time when the population, whether of true Chinese origin or of conquering Tatar dynasties and their followers, have not been more and more clothed in proportion to their rank and station. Porters may go bare-legged and bare-armed, and, in warm weather, with the body naked above the belt, but as one ascends in the orders of rank, the clothing becomes more and more complete. This tendency is not, however, accompanied by any objection to brilliant and rich stuffs. The more abundant the means of the wearer, the richer his costume—that seems to have been the rule from all time; and this is partly explained by the beauty of the floral and foliated designs. Embroidery, too, is used to heighten and complete the splendid weaves, and at least from the tenth century of our era until

the present day, the most magnificent stuffs in texture and in color are those used by the ladies and gentlemen of the Court. On the other hand, personal jewelry, that which is worn apart from the garments, is not very rich nor very costly, though it may be effective. Strings of pearls are known, and many stones that we, in the West, ignorantly despise because they are inexpensive, are made much of by the Chinese, who will use a rough turquoise, a piece of veined or spotted agate, or even a beautiful piece of glass accidentally rich in its veining and cut deliberately from the vessel to which it belonged—setting them in bronze or silver-gilt, and making a very decorative clasp, or buckle, or pommel of a sword-hilt. Chinese costume should be most carefully studied, because it has been maintained in its traditional character even to our own time. The blue cotton blouse of the working man, and the garment of delicate blue and gold silk, woven in very elaborate patterns expressly for this garment, with gold or gilt buttons spherical in shape and working in loops, are mainly the same garments as those of a century ago.

The people of India are even more divided among themselves in details of costume than are the people of Europe. The general character of the different races, north and south, leads toward a great distinction between classes of the population. The simple piece of stuff, four feet wide by thrice as long, worn by the women, is most gracefully draped about the shoulders and breast; in very recent times it is often a piece made in Europe of three large handkerchiefs, with their several borders complete. This is worn over a petticoat; arms and legs are bare, and the feet, except for occasional use of sandals; but the dark skin is barred and spotted with many and large jewels. Necklaces, broad armbands and wristlets, rings for toes and fingers, earrings, and nose-rings, are all made of silver wire for the poorer women, who often put their whole savings into these adornments. The necessity of providing for a very warm summer climate, and in the south for a wholly tropical year, has caused the making of muslins of a fineness and perfection of weave never approached in Europe, though these native manufactures have been destroyed by the competition of British cottons. A few of the native princes alone encourage the making of these exquisite weaves. Besides these there are figured cottons of such perfect make and so beautiful in design that they are worn even by princes, as if of equal importance with silk. The gold-flowered and silver-flowered textiles of silk and cotton, or even of fine cotton alone, are famous in Europe, under the name *kinkab* or *kineob*. The costume of India in general is mainly an affair of beautiful stuffs, very little shaped to the body, and usually worn loosely, and of jewels in great abundance.

Among the people of the tropical islands, the Malays, and the black and brown inhabitants of Polynesia, the art of weaving has never reached sufficient perfection to allow the stuffs to be sought for their own sake. Very beautiful patterns are printed upon cotton by the women of the larger islands, wood blocks being used for the purpose in a way almost exactly like that employed in the printing of paper hangings among the Western nations; but these stuffs, however attractive to our eyes, however superior

COSTUME



1. GREEK.
 2. ROMAN.
 3. GERMAN (Third and Fourth Century.)
 4. FRANKS (Eighth and Ninth Century).
 5. GERMANS (Thirteenth Century).
 6. NOBLES (Fourteenth Century).
 7. SPANIARDS (Sixteenth Century).
 8. ENGLISH (Henry VIII., 1509-1546).

in design, are yet inexpensive—they could be produced by any one who has a little skill in the use of the hands, and are, therefore, not a part of ceremonial or decorative costume. A few very beautiful weaves exist, as in the Solomon Islands, and especially in New Zealand, but still they are not of rare material, nor is the elaboration of the design very great. The skill in the working of metals which is great among the Indians of the continent is much smaller among the islanders, and so it happens that personal jewelry also is but little sought for by the chiefs. The result of all this is seen in the simple and tasteful use of natural productions, brilliant flowers, and richly colored fruits and seeds, which, strung as necklaces or worn as pendants, have especial significance and are attached each in its way to the traditional ceremonies of these curiously civilized peoples.

If now we turn to the race which of all peoples has had the most influence over modern intellectual life, we shall find that the Greeks of antiquity limited their desires in the way of textile fabrics to very simple patterns, as of stars or round spots arranged in a *semé* over all the surface of a stuff, and in somewhat more elaborate patterns of zigzags and frieze in the borders. Their costume, including their jewelry, was, in fact, marked throughout by extreme simplicity, which increases as our studies bring us to a later time. The statues discovered on the Acropolis at Athens since 1833 are certainly of the century before the Persian invasion of B.C. 480. They show a number of garments, certainly as many as three, worn one over the other by the priestesses represented in the statue; and each of these garments is made of a different stuff, all the stuffs, or all but the craped under-shirt (the *chiton* of later dress), covered with elaborate patterns in several colors. There is nowhere a more interesting study of brilliant coloring in costume than were these statues when first discovered, and, fortunately, the finest of them have been reproduced in water-color painting, and these water-colors often multiplied in chromolithography, and published by the archaeological societies. It is clear that, immediately after the Persian War, during the period of the Athenian hegemony in Greece, beginning with B.C. 477, the use of these striped and spotted stuffs becomes much less common, at least in the mainland of Greece, and the use of plain materials, white, bordered with stripes, or of one rather subdued color perhaps striped at the edge, becomes the rule. Those admirable bronze statues which were discovered in the famous villa at Herculaneum and now stand in the Museum of Naples (the Room of the Greater Bronzes), show perfectly well—better than any bas-reliefs, however elaborately detailed—the true Greek sense of what was beauty in costume. The long *chiton*, which, left ungirdled, would sweep the floor, is belted up so far as to allow a foot or more of its length to hang over the girdle outside of the skirt or lower part, forming a sort of pocket, known as the *kolpos*. Outside of this is seen hanging what looks like a cape, and which generally reaches just the line of the girdle, or may fall a little below it. This, however, is not a cape nor a separate garment at all: it is the reverse or turning over of the *chiton* at the top. Of the *chiton* there were several forms. The earliest was not sewn at all, and therefore left

the right side, thigh and leg, exposed on the slightest movement. A later form was a sewn-up cylinder, a long shirt in the modern sense. The stately maidens of the reliefs and the vase paintings often wear one of these two forms of *chiton*, and nothing else. To such a dress, even on occasions of great ceremony, there is nothing to be added, except perhaps a more splendid brooch on the shoulder, a broader and more brightly colored border to the *chiton*, perhaps an armlet, perhaps richer and more glittering earrings. Splendor in the more modern sense was hardly desired, and beauty was shown in the perfect taste with which these simple appliances were disposed. Other garments, however, are seen in the sculptures and vase paintings: the *himation* and a variety of it, the *chlamys*, were square or oblong pieces of woolen cloth, draped about the left shoulder and covering the body more or less as it might be adjusted; it was held sometimes by brooches. Statues show a garment arranged nearly as the Scotch plaid is, at times folded long and narrow, falling over one shoulder and passing around the waist; and this is thought to be a long and narrow *himation*. It is impossible to distinguish these garments from the *epiblemata*. The essential fact is that the Greeks, both women and men, wore a long shirt and a loose, square shawl over it, and nothing else on body or limbs.

The Etruscans, a people as devoid of refined taste as the Greeks were remarkable for it, bold and dashing designers of the coarser and more thoughtless kind, were still not more elaborately clothed than the Greeks. The later Etruscan work passes by insensible gradations into that Italian work of the centuries during which the Roman Republic and the early Empire controlled the whole peninsula, and introduced insensibly its own strongly Hellenic tendencies into the arts of the subject countries. The effect of this on the art of northern Italy was altogether fortunate, except in so far as the lover of strongly accentuated national peculiarities found reason to regret their partial disappearance. The terra-cotta sarcophagi, with high reliefs and with what are almost statues wrought upon the covers; the bronze statues and groups, the jewelry of the fourth century B.C., and the following epoch, are almost Greek in their charm, while preserving a certain attractive local color. It is probably because of this constantly increasing influence of the Grecian artistic sense upon all the nations of Italy that the Roman dress from the earliest times known to us remains Greek in its simplicity, although very different in form. The *toga* and its relations to the outer cloak of the Greeks is discussed under DRESS. Here there must be some mention of the different ways of wearing it, some of which were connected with ceremonial occasions. Thus, when a statue or a bas-relief shows a Roman draped in a large and elaborately folded toga, one fold of which is brought over the head, he is assumed by modern students to be a person who is performing a sacrifice. The toga, as ordinarily worn, showed the *tunica* in front, from the throat nearly to the waist, but the long end could be thrown over the right shoulder so as to cover the *tunica* entirely, and in this way the toga would cover the whole person, from the neck to the ankles. Here, as among the Greeks, good taste dictated the utmost simplicity of effect, except in the mere

arrangement and careful disposition of the folds. There was no other garment of the men while in the city which in any way concerned their appearance, as the only leg-coverings known were bandages or wrappers, not unlike those worn to-day by the peasantry in some parts of Europe. On the other hand, the *toga praetexta*, which was worn by certain officials, and even by some priests, had a 'purple,' that is a dark crimson border, and the *trabea* seems to have been a sort of cloak with still more elaborate stripes, including perhaps one made entirely of red cloth, which generals were allowed to wear on the day of their triumph. It is probable, however, that in this last usage the military cloak of red was worn during the triumphal procession, that being the one occasion when the soldiers of the Republic were allowed to appear within the walls with their arms and military trappings. The women were dressed as simply as the men, wearing over the tunica merely a garment called the *stola*, which replaces for them the toga of the men, and when the woman of rank went abroad, usually in a litter, a shawl-like garment called the *palla* might also be added. That which makes the peculiar stateliness of the dress seen in female statues of the early Empire is the contrast of the folds of the long tunica, reaching the floor, nearly covering the feet, and forming a strongly marked base, as it were, for the whole figure, while the more loosely folded stola above it seems to reinforce the lines of the undergarment. A veil of more or less thin and floating material covered the head, and could be brought around to the front to hide the face at pleasure. It must be constantly kept in mind that the idea of beauty in dress was simply uniform whiteness and many skillfully contrived folds; the whiteness was kept up by the use for woolen garments of the most elaborate system of cleansing applied by the *fullones*, or cleansers, and, for the folds of the drapery, highly trained experts—body servants who knew their business—were employed. It is evident how great an effect these peculiarities of dress had upon the art of sculpture.

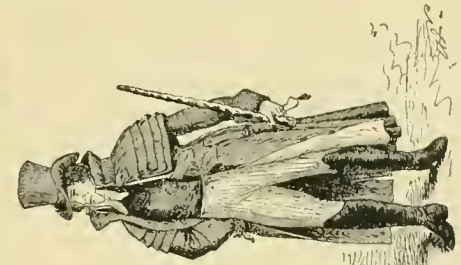
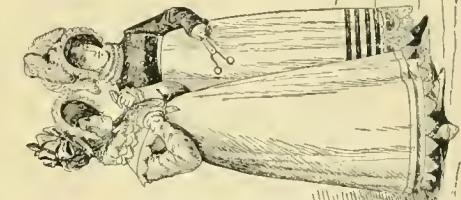
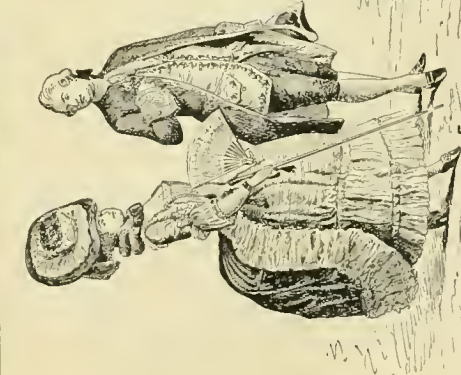
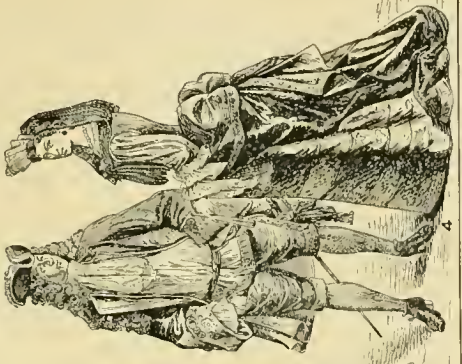
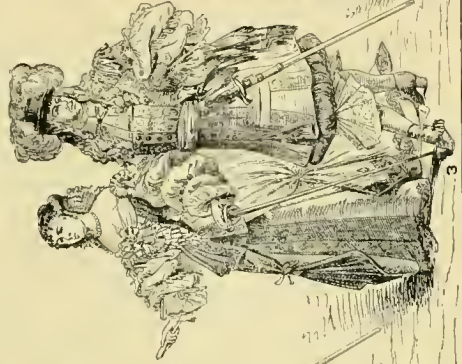
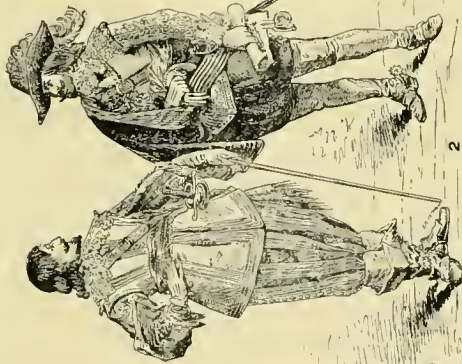
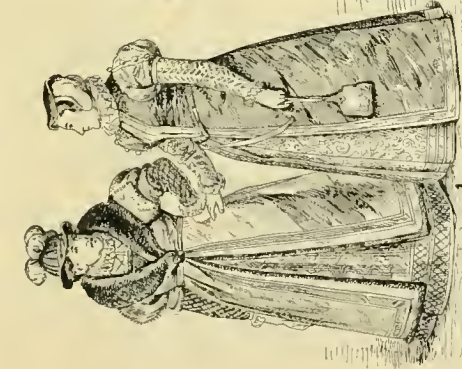
In all the above discussion of costume, one thing is very noticeable—the absence of anything like tailoring, except, perhaps, among the Chinese. The clothes of the Greeks and the Romans, like those of the people of the Pacific Islands, always approximated to the ideal of an uncut, unsewed, unaltered piece of textile fabric; square or oblong, as in the himation, chlamys, sagum, or paludamentum; semicircular or semi-oval in shape, or approximately so, as in the toga, or simply sewn down one side so as to make a tubular garment of one piece of stuff, as in the later ebition, and in the tunica. A curious reproduction of this characteristic of ancient costume exists among the wilder Arabs, the Bedouins of the desert, and the horsemen of the uplands. They wear a shirt, indeed, and this is of thicker stuff, and covers the body more completely than what we know by that name, but apart from this their covering is almost wholly a matter of unaltered or scarcely altered pieces of woolen. Perhaps two breadths of the narrower stuff are sewn together to make the *haik*, or, as in the north of Africa, a square of striped woolen stuff is caught up in the middle of one side so as to form a sort of hood, as in the *burnous*; or, as in the *aba* or *abaych*, the square of stuff may

have its two outer edges folded over toward the middle, so that the two edges meet or nearly meet, and then two openings are made in the two outer folds where the stuff is actually creased, which serve as armholes, so that the square blanket resembles an overcoat. But in all this there is absolutely no fitting of the piece of stuff to the body. It is a heavy woolen blanket, which is adapted more or less to the shoulders so as not to slip off, but is not otherwise altered in any way, and might cover a man or a woman, and a person of any stature. What is curious about this costume is the enormously heavy woolen dress worn in the desert and under the semi-tropical sun. It is evident that nothing but a heavy material is expected to keep off the heat of the sun or the burning wind of the desert; and therefore a man who wears only the long shirt, and has the legs and feet, arms and neck absolutely naked, will pile two or three of these heavy woolen things upon his shoulders and head. The result of this arrangement is that the only decoration sought for is in the beauty of two or three colors arranged in stripes of different widths, and broken more or less by the carrying of threads of different colors across the stripes, in the way of counter-charging of heraldry. A much greater development of design by stripes alone is in the cotton *dhurries* of India. The *aba* may indeed be further adorned by very simple embroidery in woolen thread.

The first appearance of any tendency to fit the garments to the person among nations more western than the Chinese is probably in the leg-coverings of the Persians and Syrians, as represented in Grecian and Greco-Roman art, and yet these garments are of extreme simplicity and there is no appearance of tailoring in any modern sense in connection with them. They are merely loose trousers, gathered at the ankles, or sleeved tunics; and their use seems to have come from the mountain regions of Asia Minor and the shores of the Caspian Sea. The barbarians of Europe, Gauls, Scandinavians, and Germans, made up suits of clothes in a not dissimilar way; but it does not seem that their example affected the Greco-Roman world very much.

The beginning of change is to be looked for in the Byzantine Imperial epoch. From a time as early as the seventh century A.D. there is a constant increase in the number of garments worn, and in the elaboration of their shape and their combination, while at the same time the costliness and splendor of the stuffs are in no way diminished, and the custom begins which was destined to have so much effect on the costume of later times in Europe, the sewing of jewels, mounted in slender rings, or *chatons*, of gold or silver gilt, to the material. Sometimes smaller fragments of glittering material of no value were used in this way, as in a later time pieces of mirror were used throughout the lands influenced by Persian decorative ideas. In the Byzantine Empire the dress of the officials shows a certain disposition to follow early Roman traditions, but only in the general shape of outer garments and to a certain extent in their names. The general aspect of a member of the Imperial family, or an officer of the Court, as it is seen in the mosaics of Ravenna, or in the illuminated manuscripts of the time, is altogether different from that of higher antiquity. The robes reached to the feet, they were closely sewed up, and not very loose

COSTUME



1. ENGLISH WOMEN (1590).
 2. ENGLISH NOBLEMEN (1625-40).
 3. FRENCH (1660-1700, Louis XIV.).
 4. FRENCH (1700-40).
 5. FRENCH (1780).
 6. FRENCH (1808—Empire).
 7. EARLY NINETEENTH CENTURY.

or flowing, not greatly tending toward elaboration of folds or to what we commonly call drapery; and over them are worn dalmatics, maniples, and stoles, not merely by the clergy, but by the laity as well, and showing plainly where the peculiar clerical dress took its origin. See COSTUME, ECCLESIASTICAL.

The Eastern influence was still strong, and all costume which was at all splendid was a matter of long and ample robes, made of stuffs of almost incredible richness, and more or less richly decorated by embroidery. Western dress was at this early time very different from anything in common use in the Byzantine Empire, except in so far as that the poorer people, and those engaged in out-of-door work, would naturally dress in almost the same careless fashion east and west. For one thing, it was more nearly classical Roman in character. If the costume of the eleventh and twelfth centuries, in the lands which are now France and Germany and England, be studied in the sculptures of Romanesque and Gothic buildings, or in the rare illuminations of manuscripts of that time, it will be seen that a certain antique or early Roman character obtains in the garments worn by persons presented as kings and princes, which had already been lost in the Eastern Empire. The robed figures of the porch of Chartres, or the doorways of Le Mans, do not seem to record much that was splendid in the way of stuffs or of jewelry, loose or applied to the garment. Their robes are still simply falling in loose folds, girded at the waist and differing from the garments of antiquity mainly in this, that the arms are always covered by sleeves. Men and women alike wore a gown, that garment which in the French archaeological vocabulary is called the *robe*. This garment, which is treated under DRESS, served for people of every rank and of both sexes, but its fashion changed very much, and in like manner the resulting appearance of the clothed figure in the sculptures changed greatly between the twelfth and the fourteenth centuries. In the fourteenth century it grew more and more into that stately but most inconvenient garment, well known to us from the paintings in manuscripts of the time of Richard II. of England, and his immediate successor, and Charles VI. of France. This garment swept the floor. It was girded around the waist with the military belt, or some modification of it; it had sleeves, which also reached the floor, and were of fullness equal to that of the skirts, covering the hands also when the arms hung down. The collar covered the neck completely in a solid cylinder, and rose on the sides nearly to the ears. How this rich and grandiose dress could be used at all in summer, and how it could be girded and shortened in any way, in time of necessity, does not appear, nor is it known whether the men wore complete leg-coverings of some kind beneath this long and completely closed skirt. The dress of elegant women of the same epoch was less elaborately conceived; the same habit of long sleeves prevailed, but the upper part of the sleeve was pierced with a slit through which the forearm could be extended. The result of this was that the robe, as a garment for women, hardly changed during the next two centuries, whereas the use of it for men went out very soon, and while there are still representations of gentlemen of the first half of the fifteenth century dressed in robes reaching

the ground, those robes are far more convenient than before; they are evidently capable of being tucked up, and the man is dressed beneath his skirt, which can either be removed or shortened up to nothing when the occasion of ceremony is passed. Finally, as early as the second decade of the fifteenth century, it disappears from the dress of men, and from that time on the short-skirted garment, called *rochet*, or corset, became the dress of business, while the name *cotte* was then and thereafter given to a very tight-fitting garment, laced or buttoned close to the body and having a skirt reaching only to mid-thigh. This last-named garment existed under the name of *cotte d'armes* as long as the complete suit of armor was worn by gentlemen, and in this case it was embroidered with the armorial bearings of the wearer. The French terms were commonly used in England as well, as Chaucer lets us know; and in modern study we can hardly find English equivalents. Under all these garments were worn the long, close-fitting stockings, serving as the only covering from the waist to the toes, except as the skirt covered the upper part of the thigh. These changes involved the complete establishment of tailoring as the main thing in elegant costume. From the middle of the fifteenth century on, the dress of nobles and courtiers, and of men who affected elegance, was a matter of cutting out and shaping, fitting in gores and gussets, and, in fact, adapting garments closely to the body in the first place, and then covering them with elaborate adornment. This might be applied in the way of *passementerie*, or by modifying the whole surface of the stuff by what we now call quilting and the like. A piece of brocade used for a doublet or the body of a gown would be gathered up into puffs and projecting rounded surfaces, the lines of sewing between those projections being themselves decorated and even including the setting of a pearl or of a jewel of some other kind set in a gold *chaton* at the junction of these two lines of stitching. The stockings were the only part of the dress that was not elaborately decorated; and these stockings were half concealed in the sixteenth century by the enormous *hauts de chausses*, which, in 1530 and the following years, are sometimes in two or three rings of puffs like rounded ridges, passing horizontally around the thigh, and which, in the closing years of Elizabeth's reign and the corresponding times in France, the reigns of Henry III. and Henry IV., are closer in their fit and resemble not distantly the knee-breeches of the eighteenth century. They are, however, made of costly stuff, and elaborately adorned almost in the style of the body-garment. Still again, in the time of James I. of England, the *hauts de chausses* were stuffed (bombasted), or held with springs in a single rounded projection, as if the man had been thrust feet foremost through a rather flat, oblate spheroid. This projected so much all around the hips that the sword had to be hung in a horizontal position and great pains taken to prevent its being entirely dislodged by the monstrous garment.

At no time during the Middle Ages and the epoch of the Renaissance was the tailoring and mantua-making more rich and fantastic than during the French religious wars, and the succeeding reign of Henry IV. Painted portraits, prints from famous engravings, carved ivories,

medallions, and painted enamels of the time, exist in some quantity; and they agree in telling the most extraordinary tale of splendid extravagance in the dress of both sexes. Embroidery was loaded upon bodice and doublet, or was dispensed with only when a very rich brocade was employed; and lace, or its earlier forms of cut-work and drawn-work, and needle embroidery in pierced patterns like filigree, were used with freedom. The circular ruff, projecting like a dish on which the head seems to lie, appears, but is not yet so popular as the broad and flat laced collar, sometimes lying on the shoulders, sometimes standing stiffly out horizontally, or for women in steep, upward slope behind the head and neck. The fashion of bombasted thigh-coverings for the men is identified in artistic history with the reign of Henry IV. of France, but it did not last very long, being replaced by the loose, short trousers of about 1625 and after. No costume in the modern sense is perhaps more graceful and spirited at once than the dress of the gentlemen of the time of Louis XIII., which, with its short trousers, the stocking below covering the calf of the leg, which was concealed by the boots commonly worn out of doors, the doublet, reaching a little below the waist, and worn loose, generally unbuttoned in front and showing the shirt in its full folds, the short cloak, worn on the left shoulder, except when it was gathered around the body, the flat hat, with very broad brim, and soft falling feather, and the broad, loose collar, is a complete and graceful translation into form of those ideas which the modern world has conceived—ideas absolutely contrary to those of antiquity. Simplicity and grace have given place to picturesque combination of small details; and here is the new theory, perfectly put into practice. The reign of Louis XIV. had but little influence on this dress of men, except to stiffen it and make it rigid and hard, but the dress of women improved on the whole in tastefulness throughout the seventeenth century, and as late as 1670 was introduced that admirable costume which we identify with Madame de Sévigné, a skirt not very full, over which was worn a short upper skirt, open in front; a bodice fitting snugly, but not involving very tight lacing; a stomacher, but not excessive in its length; sleeves reaching the elbow, and accompanied by lace ruffles, which partly shroud the lower arm; the bodice cut low, but not to excess, and a cape worn over the neck and shoulders on occasion of going out of doors. The same thing, in simpler stuffs and in graver colors, was worn by the wives of the wealthier *bourgeois*, and this is the dress which we identify with the women of Holland and the English Puritans. It is preserved for us in a great number of paintings, and in the prints from Hollar's engravings; and it has impressed itself upon modern designers as the most complete type of womanly costume which we know; but that is because the richer dress of the time is impossible to realize nowadays—it seems non-human, as if of fairy-land. The eighteenth-century dress in England, which was at times popular and acceptable in decorative design, is a modification of it, not for the better. The fop of 1750 is less beautifully dressed than the *muquet* of 1650, and the ladies of 1775, with their enormous hoops, far less charming in appearance than Madame de Sévigné a hundred years earlier.

The French Revolution in 1789 brought in a number of strange vagaries in dress, red and white striped waistcoats, stockings, striped blue and white in horizontal rings, white cravats wound round and round the neck until they reached the point of the chin, while at the same time the women wore the lightest and thinnest costume possible, in fancied imitation of the Romans. Cocked hats of exaggerated shape for the men alternated with steeple-crowned hats with curly brims; while the female costume was finished by the most elaborate pile of curls and crinups, crowned by an enormous cap, either simply of muslin and lace, or with these combined with a sort of hat half concealed with feathers, flowers, and ruffles of lace. The momentary prohibition of elegances of this sort under the Revolution led to a change in the dress of both sexes, which was not to be temporary, except in details. Thus the dress which we call that of the 'Empire,' the famous 'pink night-gown,' girded immediately below the breasts and hanging thence to the ankles, but so close that a woman could hardly walk and was utterly unable to step across a gutter, was worn with low shoes and with an unprotected neck, while the cold of winter was met by a *pelisse*, generally worn open in front and affording merely shelter for the shoulders and back, however richly it might be furred. The men fell immediately into the simple and not impressive dress of a time when the civilian was of little account, and any man who was elegant in his aspirations found some excuse to wear a military or official uniform. The civilian dress was then merely a waistcoat, over which was worn a long-skirted coat, and the *pantalon*, or tight-fitting breeches reaching to the ankle instead of the knee. The large and loose white cravat still continued. From these dresses all our modern fashions have followed, succeeding one another through such changes as this—the coat with a round skirt, projecting much from the hips, from 1830 to 1840; the double-breasted dress coat (*habit*), from 1840 to 1850, or thereabout, often blue, with gold buttons, often claret-colored or brown; the very high coat-collars, worn with either or both of these fashions, but disappearing about 1835; trousers succeeding the *pantalon*, and worn rather close-fitting, and with an immense spread, or 'spring,' at the bottom, covering the boot almost to the toes, succeeding the strapped trousers of an earlier time, and succeeded in turn by the 'bags,' as the English slang term very properly has it, which, since 1860, have remained in fashion throughout western Europe and the nations of European settlement, and constitute certainly the ugliest article of costume hitherto discovered by mankind. The dress of women, now that we approach our own time, and the changes of every year become known to us, has a relative importance so diverse, with so many and such almost imperceptible changes, that a consideration of this is left for the article FASHION.

BIBLIOGRAPHY. A general work, containing 500 plates, most of them colored, and an elaborate commentary with an analysis of each plate, as well as some essays showing considerable insight, is Raeniet, *Le costume historique* (6 vols., Paris, 1888), published both in folio and in a more convenient small quarto.

Ancient Costume.—Assyrian: Layard, *Monuments of Nineveh*, 100 plates (London, 1850); Botta, *Letters on the Discoveries at Nineveh*, trans. by Tobin (London, 1850). Egyptian: Wilkinson, *Manners and Customs of the Ancient Egyptians* (London, 1847). Greek and Roman: Hope, *Costume of the Ancients* (London, 1809; new ed., with 340 plates, 1841); Evans, *Chapters on Greek Dress* (London, 1893).

Modern Costume.—Eastern: Lane, *Account of the Manners and Customs of the Modern Egyptians*, ed. by Lane-Poole (London, 1871); the article "Dress," fully illustrated, in Hughes, *Dictionary of Islam* (London, 1885); Watson, *Textile Manufactures and Costumes of the People of India* (London, 1868), with numerous colored plates; Audley and Bowses, *Keramic Art of Japan* (Liverpool, 1875-80). European Countries: Hefner-Alteneck, *Trachten, Kunstwerke, und Geräthschaften vom frühen Mittelalter bis Ende des 18ten Jahrhunderts* (2d ed., 10 vols., Frankfurt, 1879-89); Falke, *Kostümgeschichte der Kulturvölker*, 377 illustrations (Stuttgart, 1882); Planché, *Cyclopædia of Costume* (London, 1876-79); Lacroix, *Manners, Customs, and Dress of the Middle Ages and the Renaissance* (London, 1877); id., *The Eighteenth Century, Its Institutions, Customs, Costumes* (London, 1887); Bonnard and Mercuri, *Costumes historiques des XVIIe, XVIIIe, XIXe et XVe siècles*, 200 plates (Paris, 1867); Cheygnard and Duplessis, *Costumes historiques des XIe, XVIIe, et XVIIIe siècles* (2 vols., 150 plates, Paris, 1867); Viollet-le-Duc, *Dictionnaire raisonné du mobilier français*, vols. iii. and iv. (Paris, 1872-73); Jacquemin, *Iconographie générale et méthodique du costume du I^{er} au XIX^e siècle*, 315-1815 (Paris, 1876), a large folio of 200 elaborate plates, with supplement (Paris, n. d.) of 80 more; Strutt, *Regal and Ecclesiastical Antiquities of Great Britain*, 72 plates (London, 1842); M'lan and Logan, *Clans of the Scottish Highlands* (2 vols., 72 plates, London, 1857); Planché, *History of British Costume* (London, 1874); Hill, *History of English Dress* (London, 1900); Fairholt, *Costume in England*, Bohn's Library (London, 1885), a small but trustworthy handbook. For the American aborigines: Dellenbaugh, *North Americans of Yesterday* (New York, 1901); for the English colonies in America: Earle, *Costume of Colonial Times* (New York, 1895).

Books on decorative art often deal with parts of costumes, and collections of engravings, historically arranged, like Hirth, *Kulturgeschichtliches Bilderbuch aus drei Jahrhunderten* (Leipzig, 1895), as well as prints from the engravings of Direr, Collot, Hogarth, and other realists, which are often to be had in photographic reproduction.

COSTUME, ECCLESIASTICAL. The dress worn by ministers of religion as such, in contradistinction to the dress of ordinary life in different lands and periods. It may best be treated under two heads, the costume worn by the clergy in the exercise of their public functions, and that which constitutes the distinctive dress or habit of the various religious orders and communities.

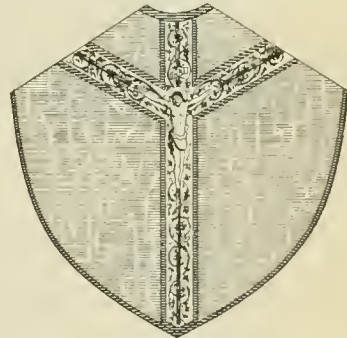
OFFICIAL COSTUME.

Under the Jewish dispensation, the costumes of the officiating priests and Levites, like everything else pertaining to the divine worship, was

minutely prescribed and rigidly observed through centuries. It seems, however, clearly established that in the earliest Christian centuries no other dress was worn by the officiating clergy than the ordinary costume of their locality. No quotation can be adduced from any author of the first five centuries alluding to any distinctive vestment. In the Middle Ages a theory was held that the vestments then in use were directly derived from the Jewish ceremonial; but so early as the middle of the ninth century Walafrid Strabo (see WALAFRID) clearly affirms that Christian priests in the early centuries officiated in the dress of common life. In this, as in so many other particulars of ritual, the delay in establishing elaborate and splendid observances may be attributed largely to the state of obscurity and proscription in which the Church lived until the time of Constantine. Special garments were sometimes set apart for use in public worship, of the same shape but of costlier material.

The use of vestments since the establishment of a formal system must be considered chiefly under the usage of the Roman Catholic Church, which has regulated them most definitely and elaborately. They may be treated under three heads—sacrificial, episcopal, and general.

SACRIFICIAL. The *chasuble* is the principal vestment regarded as strictly sacerdotal or sacrificial. It was originally an ample round mantle falling over the arms, but this, while



CHASUBLE, OLDER FORM.

a far more picturesque vestment than the modern "fiddle-back," was found practically so inconvenient that in the sixteenth and seventeenth centuries it was cut away more and more, until the arms were left entirely free. The change in form may best be seen from the accompanying illustrations. Traces of its use as a distinctively ecclesiastical vestment are found as early as the first half of the sixth century, and the Fourth Council of Toledo (633) expressly mentions it as such. Its use seems not to have been at first confined to priests; and even to this day the deacon and subdeacon at solemn mass in Advent and Lent (except on *Gaudete* and *Lætare* Sundays) wear folded chasubles, which, however, they lay aside when they sing the Epistle and Gospel. Chasubles are also sometimes worn by canons and other dignitaries simply present in choir at a pontifical mass. In most Western countries a large cross is embroidered on the back; in Italy, usually on the front. The *stole* is a narrow strip of the same material as the chasuble, with at least one cross embroidered on it—generally three, and other elaborate deco-

ration. It is considered a symbol of priestly jurisdiction, in which sense the Pope wears it constantly, even when not officiating. It is worn as a rule in the administration of all the sacra-



CHASUBLE, MODERN FORM.

ments. At mass the priest wears it crossed over his breast, and the deacon over his left shoulder; at other times it is worn hanging straight down. The earliest traces of its use in the West as a sacerdotal vestment are found in Spain, where the Council of Braga (563) speaks of the *orarium* as worn by deacons, and the Fourth Council of Toledo mentions it as a vestment of bishops, priests, and deacons. The name of stole (Gk. *σκολή*) is properly applied to an enveloping garment such as was commonly worn by women in ancient Rome; and therefore the earlier use of the word in the Greek ecclesiastical writers must not be taken as applying to what is now called a stole; *orarium*, however, in later Latin, meant a handkerchief, sometimes worn as a scarf. The employment of this word suggests that the stole may have been originally a practical appendage of linen, designed for wiping the face during the service. The *maniple* is similar to a shorter stole, worn pendent from the left wrist alike by priest, deacon, and subdeacon at mass. Its origin was very possibly similar to that suggested for the stole—though a symbolical meaning has been found for it as typifying the cords with which Christ was bound before His passion. The *alb* is a close-fitting garment of plain white linen reaching to the feet, though the lower part is nowadays often made of lace, and sometimes pieces of embroidery called apparels are sewed on it in four places. Originally it was probably nothing more than the ordinary tunic of Greek and Roman costume. It is confined around the waist by a white linen girdle. The *amice* is a piece of fine linen, oblong in shape, which the priest rests for a moment on his head, and then spreads on his shoulders, tying it by strings in front. It originally covered the head, and to this day, in the Franciscan and Dominican rites, which have

preserved certain traditional peculiarities, the priest wears it in that position until he reaches the altar. It is supposed to symbolize the helmet of salvation. The *bands* were worn by French ecclesiastics, even with street costume, and until recently very generally in Protestant pulpits, have been supposed to be a relic of the amice, but are more probably from the ruff or band of general sixteenth-century costume, which was formally prescribed by Queen Elizabeth to English clergymen. The special vestments of the deacon and subdeacon are the *dalmatic* and *tunicle*, which differ very slightly, both being close-fitting vestments of the same material as the chasuble, reaching to the knees and with tight sleeves.

The color of all vestments seems to have been white at the first. Even the pseudo-Aleuin (tenth or eleventh century) knows of no other, with one or two minor exceptions. Innocent III. (Pope 1198-1216) is the first to mention the use of four colors, naming black instead of the modern violet, which he regards as merely a variant of black. The modern usage prescribes *white* for the feasts of our Lord, of virgins who were not martyrs, and of confessors; *red* (the color of fire and of blood) for the feast of Pentecost and of all martyrs; the mourning *violet* for the season of Advent and from Septuagesima to Easter; and *green* (the color of hope) for ferial or ordinary days. *Black* is worn on Good Friday and in services for the dead. This covers the general rule; space will not allow the details of minor exceptions. Cloth of gold is supposed to take the place of white, red, or green.

EPISCOPAL. The vestments officially worn by a bishop in the exercise of his functions are numerous and partly general, partly peculiar to his office. A bishop fully vested for celebrating solemn mass wears (over a purple cassock or a black one with red buttons) amice, alb, girdle, stole, maniple, tunicle, dalmatic, chasuble, and mitre, and carries his pastoral staff in his hand. The ring and pectoral cross which he wears at other times must also be included, as must the buskins or sandals and the gloves, which complete the pontifical attire. There is also the *gremial veil*, an embroidered cloth which is spread over his knees when he sits during the service. In other functions, such as confirmation, he wears cope and mitre, with a stole for the administration of the sacraments; but if he wishes to administer e.g. confirmation less solemnly, he may wear simply the rochet. The *mitre* is the principal ornament peculiar to the episcopal office. It is a head-dress worn in solemn services by bishops and by certain abbots who preside over specially distinguished monasteries known as 'mitred' abbeys. It may be described as a tall, tongue-shaped cap, terminating in a twofold point, which is supposed to symbolize the cloven tongues in the form of which the Holy Ghost came upon the Apostles. Two mitres are worn in pontifical functions; one called the precious or costly mitre, the other of plainer material and ornament. The *pastoral staff* or *crozier* in the case of bishops resembles a shepherd's crook, and is given to them at their consecration as a symbol of the authority with which they are to rule their flocks. An archbishop's pastoral staff does not differ from a bishop's; but he sometimes has carried in front

COSTUME, ECCLESIASTICAL



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| 1. JEWISH HIGH PRIEST. | 4. RUSSO-GREEK BISHOP. |
| 2. ROMAN CATHOLIC BISHOP, with mitre, cope, rochet, stole and crozier. | 5. ANGLICAN BISHOP in rochet and chimere. |
| 3. Same in rochet and mantelletta. | 6. Geneva gown and bands. |
| | 7. Dalmatic and alb. |
| | 8. Surplice, stole, cassock, and berretta. |

of him a staff surmounted by a cross or crucifix—that of a patriarch having two cross-bars. Another vestment peculiar to archbishops is the *pallium*, a circular band of white woolen stuff surrounding the neck, with a pendent strip before and behind; the whole being marked with several crosses. It is a symbol of jurisdiction, worn by the Pope and by him bestowed on archbishops, who wear it at high mass on solemn days, but only within their own jurisdictions. The *sandals* were not originally confined to bishops; the earliest authors who mention them allude to a special shape worn by deacons and subdeacons. Their early distinct liturgical use is an incidental proof that the vestments are derived from the costume of every-day life, not from that of the Jewish priests, who officiated barefoot. The *pectoral cross* is a small gold cross adorned with jewels, which is worn on the breast by bishops and abbots as a mark of their office. Innocent III. is the first author to mention its use. The *episcopal ring*, worn on the right hand and generally set with a large amethyst, is supposed to symbolize that the bishop is wedded to his diocese. Among less formal vestments, the *rochet* alluded to above is a close-fitting vestment of linen, somewhat like a shorter alb or a surplice with tight sleeves; it is worn by bishops and abbots, also sometimes as a special privilege by canons. The *mozzetta* is a short cape covering the shoulders, a part of the state dress of bishops when not pontificating, and is worn with the rochet. The *mantelletta* is a sleeveless garment of silk or woolen stuff reaching to the knees, worn by cardinals, bishops, and other prelates. It is used to cover the rochet, so that bishops wear it when out of their own dioceses, the uncovered rochet being a symbol of jurisdiction. The other vestments worn by a bishop have already been described, with the manner of their use, except that, wearing the pectoral cross upon his breast, he does not cross the stole as a priest does when preparing to celebrate. The combination of dalmatic and tunicle with the chasuble is supposed to express the union of all the orders in the episcopal office.

GENERAL. The most important vestment to be mentioned under this head is the *cope*, a wide cloak of silk or other costly material reaching nearly to the feet and fastened in front by a clasp called the *moose*, and having a semi-circular hood at the back. While it is worn by the officiating priest in benediction and other solemn rites, it is not distinctly a sacerdotal vestment, and is worn by cantors at solemn vespers and by other laymen. The *humeral veil* is an oblong scarf of the same material as the chasuble, worn by the subdeacon at high mass when he holds the paten from the offertory to the Pater noster, and by the priest when giving benediction or carrying the blessed sacrament in procession. It is worn over the shoulders, the paten, pyx, or monstrance being wrapped in it. The Levites (Num. iv.) were allowed to bear the sacred vessels only when wrapped in coverings; and although those in holy orders (and they alone) are allowed to touch the eucharistic vessels with the bare hands, the use of the veil is probably an expression of the feeling of reverence inculcated by the Jewish rule. The *surplice* (called also *cotta* at first in Italy, now generally) is a garment of linen worn by all clerics and assistants in choir and by priests in the adminis-

tration of the sacraments. As late as the twelfth century it was supposed to reach to the ankles, but in modern times it has been very much curtailed, and since the seventeenth century commonly ornamented with lace. Under all the other vestments is worn the cassock, a close-fitting garment reaching to the feet, which is the distinctive dress of clerics, in church and out. The color varies, being black for a simple priest, purple for a bishop, and red for a cardinal; the Pope alone wears a white cassock. The *berretta* (or *biretta*), which is also a part of the priest's street or house dress, must be mentioned under official costume, as the rubrics prescribe it for the sacred ministers going to the altar and for ecclesiastics in choir. It is a square eap with three ridges extending outward from the centre of the top—four in the case of doctors of divinity. "At Rome," says Benedict XIV., "and in most churches the berretta was unknown as late as the ninth century. Its ecclesiastical use began when priests gave up the ancient custom of covering their heads with the amice till the actual beginning of the mass." The *zucchetto* is a small, round skull-cap, of color suited to the wearer's rank, which, if worn in church, is removed only at the most solemn parts of the services.

EASTERN VESTMENTS. The influence which between the eighth and twelfth centuries in the West bore so strongly upon the development of ecclesiastical costume, that of the numerous liturgical writers, was almost wholly lacking in the East, where between the Patriarch Germanus of Constantinople in the eighth century, and Simeon, Archbishop of Thessalonica in the fifteenth, scarcely one of importance is to be named. The natural conservatism of the Oriental mind has also militated against change in the ecclesiastical usages. The Western maniple, amice, and cope are unknown in the Greek and Russian churches; in place of the first-named, somewhat similar bands (*cpimanikia*) are worn around both arms by bishops, priests, and deacons, those of the bishop being richly ornamented. The lector and readers wear an ample white or reddish vestment called *phelonion*, but differing from the priestly chasuble in only reaching to the waist. The subdeacon wears the *sticharion*, a sort of dalmatic, narrower and shorter than that of the deacon, who wears in addition the *orarion* or stole hanging before and behind over the left shoulder. The *sticharion* has undoubtedly developed from the alb, but more closely resembles the dalmatic both in shape and material. The priest wears the *sticharion*, the *epitrachelion* (a long narrow stole something like an archiepiscopal pallium in the West), the *zone* or girdle, and the *phelonion* or chasuble, which in Russia is much abbreviated in front, but hangs down to the ankles behind. The episcopal vestments are in the main similar to those of the priests, but more richly decorated; the bishop's *phelonion* is adorned with many small crosses. Instead of this vestment the Greek metropolitans, and in Russia all bishops since the time of Peter the Great, wear the *sakkos*, a tight-fitting garment supposed to symbolize the seamless robe of Christ. The episcopal gloves, sandals, and ring are not in use. The head-covering resembles a crown more than the Western mitre. The specific episcopal insignia are a pastoral staff, generally

in the shape of a T; the *epigonation*, a lozenge-shaped ornament of stiffened silk bearing a cross or picture, which hangs from the girdle on the right side, and the *omophorion*, a broader pallium with four crosses. The only colors normally used for all these vestments are white and dark red, the latter in penitential seasons.

ANGLICAN AND PROTESTANT USAGE. The universal tendency of the Reformers was naturally to dissociate themselves from the older Church by abandoning to a greater or less extent the ceremonies and vestments used by it. The Lutherans and the Anglicans, however, showed a more conservative spirit than the others. Luther himself considered the matter one of indifference; and his followers for a long time retained most of the old vestments, even the chasuble being worn in Sweden and Denmark, where the Lutheran bishops also wear copes and pectoral crosses. But the Calvinists and other more extreme Reformers of the Continent abolished the older vestments completely, and adopted the black Genevan gown or *robe de Calvin*. This, which is nothing more than the ordinary dress of a scholar in the sixteenth century, with the white bands at the neck, has become a distinctive costume of Protestant ministers for officiating. In recent years there has been a notable tendency, especially among the Scotch Presbyterians, toward the restoration or adaptation of ancient customs, and surpliced choirs have been introduced among other 'ritualistic' usages. The semi-military costume of the Salvation Army officers may be referred to as in some degree illustrating the same tendency.

The question of vestments was a very thorny one throughout the whole reign of Elizabeth, whose impulse in favor of decent and orderly ceremonial, at least, ran counter to the views of the advanced Puritan party, vigorously abetted by the Continental, and especially the Swiss, Reformers. (See ADVERTISEMENTS OF ELIZABETH.) The first Prayer-Book of Edward VI. had prescribed "a white albe plain with a vestment [chasuble] or cope" for the celebrant, and albs with tunicles for the assistants. The second Prayer Book, which represented the extreme attainment of innovation, ordered that "the minister shall use neither albe, vestment, nor cope, but being archbishop or bishop, he shall have and wear a rochet; and being a priest or deacon, he shall have and wear a surplice only." But this minimizing injunction was only temporary, and was followed by a cautious return to something like the previous standard. The present law, as contained in the Prayer Book, unchanged since 1661, is somewhat vague, being merely an authorization of the "ornaments of the Church and of the ministers thereof" as used by the authority of Parliament in the second year of King Edward VI. The Ritualistic School contends that this permits, if it does not enjoin, all the ancient vestments; and in recent times the clergy of that school have restored almost all of them, copying in many cases the modern Roman usage with great exactness, so that nothing distinctive remains to be said about them. Throughout the greater part, however, of the post-Reformation period, the Anglican use was uniform; for all ministrations except preaching, a linen surplice reaching to the feet and open in front, without a cassock, and a wide black stole (or more properly scarf, since it is contended with some

show of probability that it was not a stole, but the scarf worn as a distinctive mark by noblemen's chaplains), and for preaching the black gown with bands, until toward the middle of the nineteenth century it was displaced amid a storm of controversy by the surplice for that function also. The use of the surplice by men and boys in the choirs of English cathedral and collegiate churches was continuous throughout the post-Reformation period, and with the ritual revival became general in other churches as well, the cassock being added. In the closing years of the nineteenth century the custom of arraying women singers in these vestments was adopted by a number of churches, but strongly reprobated by many bishops as a gross violation of propriety.

The history of Anglican episcopal costume has some curious features. The first Prayer Book of Edward VI. directed a bishop "to have upon him, besides his rochet, a surplice or albe, and also a cope or vestment [chasuble] and also his pastoral staff in his hand or else borne or holden by his chaplain." Amid the gradual dis-use of the older vestments, the cope continued to be frequently worn, instead of the chasuble, in cathedrals, as expressly enjoined by the twenty-fourth canon of 1603. Blunt says "it was so used in Durham Cathedral until the end of the eighteenth century, being first discontinued by Bishop Warburton, through irritable impatience on some collision between his wig and the collar of the cope." The characteristic dress of the modern Anglican bishop consists of rochet and chimere; the latter may be merely a survival of a sleeveless garment so called, worn by persons of position in the thirteenth to sixteenth centuries, but more probably originated as an episcopal dress from the habit of bishops under Henry VIII. and Edward, of wearing their scarlet doctor's gowns with their rochets; in Elizabeth's reign the more sober black was substituted, and the tailors of the Stuart period sewed the sleeves of the rochet, greatly enlarged, to the chimere. The latter may be pressed into an analogy to the mantelletta of Roman Catholic bishops.

MONASTIC COSTUME.

The principle of uniformity of dress to mark those who lived a common life was adopted even among the early monks of the Egyptian deserts. The character of the Eastern religious costumes was usually, as far as can be determined from the vague descriptions of early writers, such as to express a spirit of penitence and differentiate their wearers from the gaily dressed worldlings. The early Western founders, Saint Benedict and even Saint Francis, prescribed the general character but not the exact shape and color of the garments to be worn by their followers. Custom gradually, in a community life, crystallized into rule. But since the thirteenth century the founders of orders have usually laid down the exact details of the habit to be worn, as a sort of regimental uniform. The notable exceptions are Saint Ignatius, Saint Philip Neri, and Saint Vincent de Paul, whose followers have never worn anything but the ordinary dress of secular priests. The wearing of the habit at all times is most strictly enjoined upon members of religious orders, except when it is sometimes dispensed with in non-Catholic countries; the early Jesuits in China, in pursuance of their policy of adapting themselves to the customs of the country, wore

the native costume. (See illustration of Father Adam Schall in the dress of a mandarin.) Normally, however, the habit is always worn, taking



FATHER ADAM SCHALL, S. J., IN MANDARIN COSTUME.

the place for preaching (and in some places for administering the sacrament of penance) of the surplice and stole. For specific details of the costume of the various orders, see the articles under their titles.

BIBLIOGRAPHY. Rock, *Hierurgia* (London, 1833); Pugin, *Glossary of Ecclesiastical Ornament and Costume* (70 plates, London, 1844); Marriott, *Vestiarium Christianum* (London, 1868); Boek, *Geschichte der liturgischen Gewänder des Mittelalters* (3 vols., Bonn, 1859-71); Maskell, *Monumenta Ritualia Ecclesie Anglicane* (London, 1846-47); Hefele, *Beiträge zur Kirchengeschichte, Archäologie und Liturgik* (Tübingen, 1864-65); Macalister, *Ecclesiastical Vestments, Their Development and History* (London, 1896); Baldeschi, *Esposizione delle sacre ceremonie* (Rome, 1865); Seudamore, *Notitia Eucharistica* (London, 1872); Dolby, *Church Vestments* (London, 1868); Rajewski, *Euchologia der orthodox-katholischen Kirche* (Vienna, 1861).

COS'WAY, RICHARD (1740-1821). An English miniature-painter, born at Tiverton. He studied in a London drawing-school, while serving as waiting-man there, and in 1771 became a member of the Royal Academy. He painted in oil and water-color, but his fame rests principally on his miniatures, most of which were of the aristocracy.

COT. kôt, PIERRE AUGUSTE (1837-83). A French painter, pupil of Cogniet, Cabanel, and Bouguereau. He painted at first historical subjects, later also portraits, and acquired great reputation, especially by his female heads. Among his most noteworthy works are: "Spring Time;" "Day of the Dead at the Campo Santo of Pisa;" "Dionisia;" "Prometheus;" "Meditation;" and "Mireille," in the Luxembourg Gallery. He was decorated with the cross of the Legion of Honor.

COTA. RODRIGO C. DE MAGUAQUE. A Spanish poet of the fifteenth century, born at Toledo. His reputation rests upon the dainty, witty *Diálogo*

entre el Amor y un caballero viejo, which appeared first at Modena in 1569. The authorship of this poem has been much disputed, but it seems quite safe to attribute it to Cota. He wrote *Las Coplas de Mingo Revulgo* (c.1472), and may have written the first act of the comedy *Celestina* (1480), which was finished by Rojas. He also produced some satiric poems.

COTAN'GENT. See TRIGONOMETRY.

CÔTE-D'OR, kôt'dôr' (Fr., golden hill). A department in the east of France (q.v.), formerly part of the Province of Burgundy (Map: France, L 4). Area, 3383 square miles; population, in 1896, 366,054; in 1901, 361,626. The surface is in general elevated, and is traversed by a chain of hills forming the connecting link between the Cévennes and the Vosges. A portion of that range, the Côte-d'Or ('golden hill'), which gives its name to the department, is so called on account of the excellence of the wines produced on its declivities. A great part of the department is covered with forests. The valleys and plains are fertile, and there is good pastureland, but agriculture is in a backward state. Côte-d'Or is watered by the Seine, which rises in the northwest, and by several of its affluents; by the Saône, and by the Arroux, a tributary of the Loire. Capital, Dijon.

COTELIER, kôt'lyá', or **COTELE'RIOUS**, JEAN BAPTISTE (1627-86). A French Hellenist. He was born in Nîmes, studied theology and philosophy in Paris, and in 1654 became counselor of the Archbishop of Embrun. He was appointed assistant librarian in the Royal Library in 1667, and in 1676 he became professor of Greek at the Collège de France. His principal publication, and one which made him widely famous, was his edition of the *Sanctorum Patrum qui Temporebus Apostolicis Floruerunt Opera Græce et Latine* (Paris, 1672). It was republished by Lelere in 1698, and another edition of it appeared in 1724.

COTES, kôts, ROGER (1682-1716). An English mathematician and physicist. He was born at Burbage, in Leicestershire; was graduated at Trinity College, Cambridge; became a fellow in 1705; and, in 1706, on the recommendation of Newton, Whiston, and Bentley, was made Plumian professor of astronomy. Cotes was editor of the second edition of Newton's *Principia* (1713). Various mathematical papers of his own, bearing on logarithms, trigonometry, and geometry, were published posthumously under the title *Harmonia Mensurarum* (Cambridge, 1722). Several theorems are known by his name—e.g. to determine the harmonic mean between the segments of a secant to a curve of the *n*th order reckoned from a fixed point (see CURVES; CIRCLE); and also the well-known theorem of trigonometry: If A is any point on the radius OB of circle O, and if the circumference is divided into *n* equal parts BP₁, P₁P₂, P₂P₃, . . . and into 2*n* equal parts BQ₁, Q₁P₁, P₁Q₂, . . ., the product AP₁ · AP₂ · AP₃ · . . . (*n* factors) = ± (OAⁿ - OBⁿ), and AQ₁ · AQ₂ · AQ₃ · . . . (*n* factors) = OAⁿ + OBⁿ.

Cotes was held in the highest esteem by the scholars and scientific men of his time. Newton remarked of him: "If Cotes had lived, we might have known something."

COTES, SARA JEANNETTE DUNCAN (1861—). An English novelist. She was born at Brant-

ford, Ontario, Canada, and was educated at the Collegiate School there. She found her way to the novel through letters and sketches contributed to newspapers and periodicals, and made a brilliant success in *A Social Departure*, the observations of a tour round the world in 1889-90 with Mrs. Lilian Rood. In 1891 Miss Duncan married Everard C. Cotes, a press correspondent of Simla, India, and has since written several stories of Anglo-Indian social life. Among her novels are: *An American Girl in London* (1891); *A Daughter of To-day* (1894); *Vernon's Aunt* (1894); *The Simple Adventures of a Memsahib* (1893); *The Story of Sonny Sahib* (1894); *His Honour and a Lady* (1896); *A Voyage of Consolation* (1898); *The Path of a Star* (1899); *The Other Side of the Latch*, the diary of an invalid in Simla (1901); *Those Delightful Americans* (1902).

CÔTES-DU-NORD, kôt'-du-nôr'. A department in the northwest of France (q.v.), formerly a part of Brittany, bounded on the north by the English Channel (Map: France, D 3). Area, 2659 square miles. Population, in 1896, 602,657; in 1901, 609,349. The Armoric hills, called also the Montagne Noire, and the Menez Mountains, cross the department from east to west. These formations give a rude and broken aspect to the coasts. The chief rivers, which are short but navigable, are the Rance, Gouët, Trieux, Guer, and Arguenon. The cultivation of flax and hemp, with the pasturing of cattle and iron-mining, supply employment in the mountainous districts; while in the sheltered valleys and on the coast levels grain, with pears and apples and other fruits, are produced. The coasts are well supplied with various kinds of fish. Capital, Saint Brieuc.

COTGRAVE, RANDLE (?-c.1634). An English lexicographer, born in Cheshire, and educated at Saint John's College, Cambridge. It was while he was secretary to William Cecil, Lord Burghley, that he compiled his French-English dictionary (1611). Other editions were published in 1632, 1650, 1660, and 1673. The work contains many absurd errors, but it shows much more care than similar productions of that time, and is still much used by philologists.

CÖTHEN, or **KÖTHEN**, kē'ten. An ancient town of the German Duchy of Anhalt, situated on the Ziehe, about 22 miles north of Halle (Map: Germany, D 3). The streets are broad and the town is neat and well built. It is surrounded by high walls, and is divided into the old and new towns and four suburbs. Among its notable public buildings are the Gothic Church of Saint James, with some fine old stained glass and a handsome organ, and the former palace, now used as a museum and containing a library of 20,000 volumes. The chief industry is the manufacture of beet-sugar; there are also iron-foundries and machine-works. Population, in 1890, 18,215; in 1900, 22,100. Cöthen was an old Slavic settlement, and received municipal privileges in the twelfth century. In 1547 it joined the Schmalkaldic League and was taken by Charles V. Until 1853 it was the capital of the Principality of Anhalt-Cöthen.

COTHURNUS. See **BUSKIN**.

COT/DAL LINES. A system of lines on a globe or chart which show the movement of the

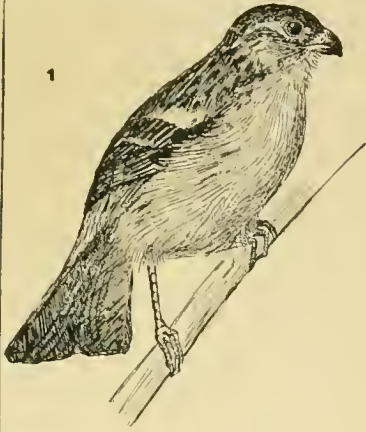
ocean tidal waves. The lines join the places where high water occurs at the same moment.

COTILLON. A French dance, the same as the german, and performed to quadrille music. It was a fashionable dance at the Court of Charles X., where it had been adapted from a peasant dance. At first for one, then for two performers, it soon became a *roude* dance, in which form it was introduced into England. There are hundreds of possible figures in the modern dance and the accessories are most elaborate. The cotillon is begun by a small number of couples, who occupy the floor while the rest of the guests sit about the ballroom. These couples select others from among those seated, and after going through a figure all take seats and are replaced by other couples until the whole company has danced that particular figure. Another method is for each set of couples to dance a different figure. There is a good description of some excellent figures in Grove, and collaborators, *Dancing* (London, 1895).

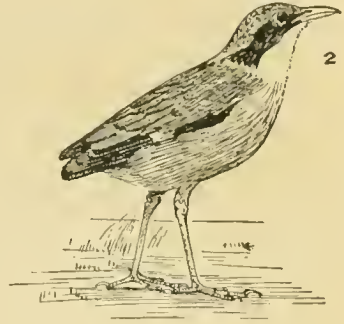
COTIN, kôt'tän', CHARLES (1604-82). A French poetaster, born in Paris. He was royal councilor and almoner to the King under Louis XIV., and in 1655 was admitted to the Académie Française. His knowledge of the Oriental and classic languages was extensive, and he was a member of the literary circles of the Hôtel Rambouillet and other salons. His verse, of which the *Poésies chrétiennes* (1657) are the most creditable, is of no importance. He is, however, unenviably famous as the object of Boileau's ridicule (*Satires*, 3, 8, 9) and the original of Trissotin in Molière's *Femmes savantes*.

COTINGA, kō-tēn'gā, or **CHATTERER** (native South American). A bird of the family Cotinidae, allied to the waxwings and manakins. Cotingas are numerous, both in species and individuals, inhabit tropical America exclusively, feeding on insects and fruit, and are remarkable for the splendor of the nuptial plumage worn by the males in many cases, or for eccentricities of ornament. The bell-bird and umbrella-bird, elsewhere described, are cotingas exemplifying such peculiarities, and the cocks-of-the-rock are included by some systemists. They have been specially studied by Dr. Leonard Stejneger, who refers to the group as follows in the *Standard Natural History*, vol. iv. (Boston, 1885): "The greater number of the species of cotinga are plain-colored, gray, rufous, or greenish . . . though even among these rather modest forms there are some which are more or less highly adorned. Among these is the rose-breasted 'fly-catcher' (*Hadrostomus Aglaia*), with a beautiful crimson rosy patch on the breast, which just enters our fauna across the southern frontier. Nevertheless, the cotingas are, generally considered, especially bright-colored and curiously adorned birds. . . . From Central America we have the exquisite *Carpodectes*, white all over, with a delicate tinge of bluish-gray washed over the upper surface; from Guiana to Brazil are found the deep purplish-carmine *Xipholena*, with white remiges, and the great wing-coverts singularly lengthened, narrow and stiffened, like a woodpecker's tail-feathers; the glorious cotinga, shining azure-blue, with purple throat, from the same countries; the greenish, fork-tailed *Phibalura* from Brazil; and the small, pipra-like *Iodopleura*, curious on account of the rare lilac

COTINGAS, ETC.



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5

1. BAND-TAILED PLANT CUTTER (*Phytotoma rara*).
2. YELLOW-CRESTED PITTA (*Pitta coronata*).
3. AMAZONIAN COCK-OF-THE-ROCK (*Rupicola rupicola*).

4. GOLDEN-CAPPED MANAKIN (*Pipra auricapilla*).
5. ECUADORIAN UMBRELLA-BIRD (*Cephalopterus penduliger*).

color of the sides of the body hidden under the wings." Of all these the females are plainly colored, mostly gray, and are therefore inconspicuous when making their nests or brooding—an important precaution against the extinction of the race; and the gaudy hues of the males are molted to a great extent during the off-season, when their dress is much plainer than in the season of courtship. None of these birds are notable as singers, though several utter loud and singular cries. See Plate of COTINGAS.

COTISE, kō'tīs, or **COST** (Fr. *côte*, side). In heraldry (q.v.), one of the diminutives of the bend.

COT'MAN, JOHN SELL (1782-1842). An English engraver and painter, born at Norwich. He painted in oil and water-color, but is probably better known by his architectural etchings, collected and published under the title, *Etchings of Architectural and Picturesque Remains* (1838). There are two water-color drawings by him in the South Kensington Museum, London, and one picture in the National Gallery. Cotman is now more appreciated than when he was alive, and is called the most gifted of the Norwich school.

COTONEASTER (Neo-Lat., from Neo-Lat. *cotouca*, quince, Lat. *cotonea*, wallwort). A genus of plants of the natural order Rosaceæ. The species are pretty numerous, shrubs or small trees: some of them evergreen, with simple, undivided leaves, more or less woolly beneath, small flowers in lateral cymes, and small fruit not agreeable to the palate, but the bright color of which, and its remaining on the tree in winter, make them very ornamental. These plants, while common in Europe, seem little known in the United States. *Cotoneaster integerrima* is a deciduous species, a native of hills in Europe and Siberia. *Cotoneaster tomentosus* is found in the Alps. Most of the species are natives of mountainous parts of Asia: they are sufficiently hardy for the climate of Great Britain, where they are among the most common ornamental shrubs. Some of them, as *Cotoneaster rotundifolia* and *Cotoneaster microphylla*—both from the north of India—are much used for covering walls.

COTOPAXI, kō'tō-pāk'sé; *Sp. pron.* kō'tō-pä'né. The loftiest active volcano in the world. It is in Ecuador, in the eastern chain of the Andes, about 40 miles nearly south of Quito, and about 50 miles south of the equator, in longitude 78° 42' W. (Map: Ecuador, B 4). La Condamine estimated the height at 18,860 feet; Reiss, the first to ascend it (in 1872), found it to be 19,500 feet; and Whymper (in 1880), 19,613 feet. The valley at its foot, however, is itself over 9000 feet above the sea. The upper part of Cotopaxi, a perfect cone for a distance of 4400 feet, is entirely covered with snow, with the exception of the immediate margin of the crater, which is a bare parapet of rock. The snow-line on the northern exposure is 15,600 feet, and on the southern exposure 15,200 feet, above sea-level. Reiss, whose measurements are largely accordant with the more recent ones of Whymper, estimated that the crater, which is elliptical, has a depth of 1500 feet and a maximum diameter of about 2600 feet. Below the snow-line is a well-marked barren belt covered with lichens and shrubs, below which again is forest. Smoke issues from

the summit; sounds as of explosions are occasionally heard; and, also, a fiery glow is often visible by night. Lava rarely flows even during eruptions, but flame, smoke, and immense volumes of ashes are then ejected; and when the heat melts large masses of the snow lying on the sides, destructive floods are occasioned in the valleys beneath. The first eruption recorded was in 1533. Others followed in 1698 and 1743, since which date numerous eruptions have occurred. One of the most violent was that of 1768, during which ashes, thrown high into the air, were transported by the winds and thickly strewn over an area of about 250 miles in diameter. One of the more recent violent eruptions was in 1877.

COTRONE, kō-trō'nā. An episcopal city (since the sixth century) on the Gulf of Taranto, 146 miles, by the winding railway, south of Taranto (Map: Italy, M 8). It has a castle of the time of Charles V., a cathedral, and an excellent, though small, harbor. Of the Temple of Hera on the Caeinian promontory (now Cape Colonne), seven miles to the southeast, which was the most magnificent structure of the kind in Magna Græcia, only one solitary, but conspicuous, column remains. The worship of Hera has been replaced by that of the Madonna del Capo, to whose church, near the temple, the young girls of Cotrone go in barefoot procession every Saturday. The town markets oranges and other fruit, oil, licorice, wine, grain, and turpentine. The ancient Cotrone was an Achaean colony, founded in B.C. 710. In B.C. 540 Pythagoras, after being banished by Polycrates of Samos, established his brotherhood here and acquired such influence in the oligarchical council that the people rebelled, and expelled the Pythagoreans and established a democracy. Cotrone suffered severely during the Pyrrhic wars (see PYRRHIUS) and in the later years of the Second Punic War was Hannibal's headquarters for three successive winters. It then sank into obscurity not to appear again in history until the wars of Narses and Belisarius (q.v.) against the Goths. In the days of Herodotus, and long after, the medical school of Cotrone was the most famous in the Greek world. Population (commune), in 1881, 9649; in 1901, 9610.

COTS'WOLD. See SHEEP.

COTSWOLD, or **COTESWOLD HILLS** (village meadow, from *cot*, hut + *wold*, meadow). A range of oolitic and lias hills, running through the middle of Gloucestershire, England, from Clipping Camden in the northeast to near Bath in the southwest, parallel to the Avon and Severn (Map: England, D 5). They are 54 miles long, in some parts 8 miles broad, and cover 312 square miles, with an average height of 500 to 600 feet. The highest points are Cleave Hill (1134 feet) and Broadway Hill (1086 feet). The surface is generally bare, but corn, turnips, and sainfoin are grown, and coarse-wooled sheep are raised.

COTTA. The name of a family of German publishers, whose establishment was founded in Tübingen in 1649. It included the eminent theologian, JOHANN FRIEDRICH FREIHERR VON COTTA (1701-79), and his grandson, JOHANN FRIEDRICH VON COTTA (1764-1832), the most eminent publisher in German history. Educated for the law, he began the book business at Tübingen in 1787, and in 1795 began to publish Schiller's *Horen*,

the *Politische Annalen*, and an architectural annual. In 1798 he issued *Die Allgemeine Zeitung* (q.v.), the *Damcnblanach*, and some like undertakings. The *Litteraturblatt* and the *Kunstblatt* followed. Cotta was publisher for nearly all the distinguished literary men of the classical epoch. In 1810 he moved his printing-house to Stuttgart; in 1824 he introduced the first steam printing-press into Bavaria, and later he helped to found the Literary and Artistic Institute at Munich. In politics Cotta was a moderate but steadfast Liberal. He was a practical social reformer, abolishing serfdom on his estates, building model farms, and making them in effect neighborhood experiment stations. The house of Cotta is still among the greatest publishing firms in Germany.

COTTA, BERNHARD VON (1808-79). A German geologist, born at Zielbach. After studying at the School of Mines at Freiberg, and at the University of Heidelberg, he was associated with Naumann in the publication of a geological map of Saxony (12 sections, 1833-42), and from 1841 to 1874 was professor of geology at Freiberg. His publications, many of which have been translated into English, include: *Geognostische Wanderungen* (1836-38); *Anleitung zum Studium der Geognosie und Geologie* (3d ed., 1849); *Deutschlands Boden* (1854); and *Die Geologie der Gegenwart* (5th ed., 1878). In the latter work he proved himself an evolutionist, and an adherent of Darwin's theory of the origin of species. He was one of the first geologists to accept this theory and apply it to organic remains in sedimentary rocks.

COTTA, HEINRICH (1763-1844). A German forester of distinction, born near Wasungen. He studied at Jena, in 1801 became a master forester and a member of the Eisenach College of Forestry, and from 1795 to 1811 conducted at Zillbach a school of silviculture, founded by himself. In 1811 he was summoned to Saxony as counselor of forestry, and thither removed his school, which in 1816 received the title of 'Royal Academy of Forestry.' He wrote a number of volumes, including: *Anweisung zum Waldbau* (1817; 9th ed., 1865); *Die Verbindung des Feldbaues mit dem Waldbau* (1819-22); and *Grundriss der Forstwirtschaft* (1832; 6th ed., 1872).

COTTAGE (OF, *cottage*, ML. *cotagium*, from AS. *cot*, Icel. *kot*, hut). Formerly a term used in Great Britain for a small dwelling-house of a poor family, especially in the country, detached from other buildings. It had no second story (though sometimes garret-rooms), and was built usually of stone and thus distinguished from wooden cabins or huts, though wood was not excluded. Recently the term has been extended to mean country houses of moderate extent, but built especially as summer residences for well-to-do families; and finally it is applied, in the United States, to the most sumptuous summer residences at places like Newport and Bar Harbor.

COTTAGE CITY. A town, including several villages, on the northeast side of Martha's Vineyard Island, Dukes County, Mass., 22 miles southeast of New Bedford (Map: Massachusetts, F 5). One of the most popular resorts on the New England coast, it contains several hotels, camp-meeting grounds, and a public library, and

is noted for its invigorating air and fine bathing. Population, in 1890, 1080; in 1900, 1100.

COTTAR'S SATURDAY NIGHT, THE. A poem by Robert Burns, published with a volume of other verse in 1786. It describes the homely pleasures of the Scottish laborer when the week's work is completed.

COTTBUS, kö't'bus. A town of the Prussian Province of Brandenburg, situated on the Spree, about 70 miles southeast of Berlin. It is a mercantile centre of importance, with manufactures of linen, wool, yarn, jute, and carpets (Map: Germany, F 3). Population, in 1890, 34,910; in 1900, 39,327. Cottbus was founded in the tenth century by Henry I. In 1445 it was sold to the Elector of Brandenburg. It belonged to Saxony from 1807 till 1813, when it passed to Prussia.

COTTE, kö't, ROBERT DE (1656-1735). A French architect. He was born in Paris, and was a pupil and brother-in-law of J. H. Mansard. He at first attended only to the details of the work done by his master; but he afterwards built the chapel of Versailles, the colonnade of the Trianon, the dome of the Invalides, the Hôtel de la Vrillière (now the Bank of France), and left designs for the portal of Saint Roch and for many buildings outside of his own country. Cotte was made first architect to the king (1708), after the death of Mansard.

COTTENHAM, Earl of. See PEPYS, CHARLES CHRISTOPHER.

COT'TER, JOSEPH B. (1844—). An American Roman Catholic bishop, born in Liverpool. He came to America in his youth, and was educated at Saint John's University. After holding a pastorate at Winona, Minn., for eighteen years, he was in 1889 consecrated first bishop of that diocese. He has been active in the temperance movement, and has several times acted as president of the Total Abstinence Union of America.

COTTEREAU, kö't'rô', JEAN. See CHOUANS.

COT'TIDÆ (Neo-Lat. nom. pl., from Neo-Lat. *cottus*, Gk. *κόττος*, *kottos*, a sort of river-fish, probably the bullhead). A family of small, ugly-looking, spiny-rayed fishes having a large depressed head, usually armed with spines or tubercles, and a tapering body, which may be naked or irregularly armed with scales or bony plates. There are about 60 genera and 250 species. The typical genus is *Cottus*. Nearly all are small. They inhabit the rocky shores and pools of the northern regions, some of the species descending to great depths. Many inhabit fresh waters, occupying the clear, cool streams of northern regions. The family includes the sculpins, miller's-thumb, grubby, father-lasher, etc. Very few are used as food. See SCULPIN.

COTTIERS, kö't'ti-ēr-z. A term originally indicating tenants who rented cots or cottages, or at the most a plot of land too small to be designated a farm; but later the term had a more general application to peasant farmers whose rent was determined not by custom, but by competition. The most notable case of this system of land tenure was in Ireland, where the capitalist farmer was scarcely represented in the population. The same class in the western parts of Scotland are called 'crofters.' Among both the lack of capital and the competition for land, inducing rack-rent, has provoked much misery. It has been partially alleviated in Ireland by the

gradual diminution of the population. See IRISH LAND LAWS.

COTTIN, kó'tán', ALARIC. A nickname of Frederick the Great, originated by Voltaire.

COTTIN, GROSPIE RISTEAU (1770-1807). A French novelist, born at Tonneins, and generally known to a now past generation as the author of *Elisabeth ou les exilés de Sibérie*, which won the praise of imitation from Xavier de Maistre in *La jeune Sibérienne* (1825). In France her vogue was not lasting. Sainte-Beuve says that by 1840 her books were read only 'from curiosity to learn the emotional moods of our mothers.' She died in Paris, August 25, 1807.

COTTLE, JOSEPH (1770-1853). An English publisher, born probably in Gloucestershire. He opened a bookshop in Bristol and was instrumental in publishing some of the first poems of Southey, Coleridge, and Wordsworth. He remained in business from 1791 to 1799. After his retirement he produced several volumes of poetry, such as *Malvern Hills* (1798); *John the Baptist* (1801); *Messiah* (1815), which awoke the satire of Byron. His *Early Recollections, Chiefly Relating to Samuel Taylor Coleridge* (1837), with a second edition under the title *Reminiscences of Coleridge and Southey* (1847), contains interesting information on the early lives of Coleridge and Southey, but is disfigured by many details that show Cottle himself in an unpleasant light.

COTTON (Fr., Sp. *coton*, from Ar. *qūṭun*, *quṭn*, cotton, from *qaṭana*, to inhabit). An important vegetable fibre distinguished from all other fibres by the peculiar twist it possesses, which makes it exceedingly valuable for spinning. It is cultivated in those parts of the globe between the two thirty-fifth parallels of latitude (a region which contains the largest portion of the land surface of the globe), although its most profitable cultivation is between the twentieth and thirty-fifth parallels north of the equator. Within this belt lie the cotton districts of the United States, northern Mexico, Egypt, northern Africa, and Asia, except the extreme southern parts of India and the Malay Peninsula. South of the equator cotton is grown in Brazil, nearly all of which country is said to be favorably adapted to its cultivation; in Australia, though not to any great extent; in Africa, where the extent of production is not known, and in the islands of the Pacific. Cotton is grown under wider range of climatic conditions, over a greater area, and by a greater variety and number of people, and is useful for a larger number of purposes than any other fibre. Its cheapness and the extent of its production preclude the demand ever exceeding the supply except locally and temporarily. Although cotton is grown mainly for the fibre surrounding its seeds, its by-products, the seeds as a source of oil and cake, and also the fibre of the stalks, are of great importance. See COTTONSEED AND ITS PRODUCTS.

BOTANICAL AND COMMERCIAL CLASSIFICATIONS. The cotton of commerce is the product of a few species of *Gossypium*, a genus of the natural order Malvaceæ, to which also belong the hollyhock, mallow, hibiscus, etc., as may be readily seen by a comparison of their flowers. (For illustration, see Plate with article HEMP.) There are in all about 50 species of *Gossypium*, only a few of which are economically important. They are small trees, shrubs, or herbaceous plants, and in

their duration are perennials, biennials, or annuals. The leaves of the cultivated species are three to seven, or even nine-lobed, and are more or less sprinkled with small black or pellucid dots. The flowers vary in color; the common colors in the United States are white or light yellow, with purple spots at base, the whole flower turning red the second day after opening. The flowers usually are borne singly in the axils of the leaves except in the 'cluster' type, where a number occur together. At their bases the flowers are surrounded by three or more green heart-shaped bracts, which are deeply cut or fringed and are united at their bases to form a cup. These constitute the 'squares.' The fruit, known as the boll, is a three to five-celled capsule, containing the numerous seeds, more or less covered with lint, which is white or tawny. All of the species are of tropical origin, yet their most successful cultivation is in temperate climates where there is a period of six months free from frosts and where there is an abundant and well-distributed rainfall throughout the growing season. An increasing temperature during the period of greatest growth is believed to be conducive to the production of the best fibre, and in India, where a lower grade of staple is produced, the decreasing temperature at this period is held responsible for the inferior quality. The botanical origin of plants that have long been in cultivation is always a source of perplexity, and the exact species to which the different varieties of cotton belong has been the subject of much controversy. By almost common consent it is now agreed that most of the cotton of commerce is the product of three or four species and their hybrids. These species are *Gossypium arboreum* and *Gossypium peruvianum*, arborescent species grown only in the tropics; *Gossypium barbadense*, the source of the celebrated Sea Island cotton, and *Gossypium herbaceum*, the species from which most of the crop of India and the United States is grown. By some the American upland cotton is believed to have originated from *Gossypium maritimum* and *Gossypium hirsutum*, but these are now believed to be the same as *Gossypium barbadense* and *Gossypium herbaceum*. There is perhaps no other plant that responds so quickly to changes in environment and improved cultivation, and to this are doubtless due the many varieties and species.

The Sea Island cotton, *Gossypium barbadense*, with its beautiful, long and silky staple, is one of the most valuable of the races or species of cotton. The flower is of a rich cream-color and its seeds are black, small, and easily separable from the lint. This species attains the highest perfection along the coast region of South Carolina, Georgia, and Florida, with well-known varieties grown under irrigation in Egypt from American seed. The fibre of Sea Island cotton averages about one and three-quarter inches in length, with one and one-half to two and one-half as the extremes. It is adapted to the finest thread and lace work, and other products for which the short staple is not suited. The Egyptian varieties are usually a little shorter in staple and are of a tawny color. These are often used for the natural colored halbriggan underwear, hosiery, etc., where a smooth finish and silky lustre are desired. The cultivation of Sea Island cotton is highly developed, and the United States crop of 1898-99 was 67,611 bales of 500

pounds each. About the same amount is annually imported into the United States from Egypt.

The upland cotton of the United States is mostly derived from *Gossypium herbaceum*. In this country the varieties of this species have white flowers, which turn red the second day after opening. The fibre of this series is shorter, but the plant can be cultivated over a greater extent of territory than the others. The seed of the upland varieties is usually of a greenish color and has a closely adherent gray fuzz in addition to the longer lint, making the process of ginning more difficult. There are doubtless many hybrids between these series, as may be seen in the character of some upland cottons. In 1896 descriptions were published in the United States Department of Agriculture, Office of Experiment Stations, *Bulletin 33*, of more than 130 varieties of cotton in cultivation in the United States at that time, together with about an equal number of so-called varieties which were only old ones renamed. Most of these varieties were upland cottons, and they varied widely in their production and character of lint. *Gossypium arboreum* is a small tree rather common about the temples of India and China, but it is said never to be cultivated as a regular crop. The trees are rather short-lived, and they yield a fine, silky fibre an inch or more in length. This is called *Nurma* or *Deo* cotton and is little used except by the priestly class. It is probable that its value has been overrated. It will not mature in the United States. The origin of the cottons supposed to be derived from *Gossypium Peruvianum* is somewhat in doubt. They are South American, as their name would indicate, and their smooth black seeds adhere in a reniform mass, hence the name 'kidney cotton,' which is usually applied to them. Their fibre is strong, rather coarse and woolly, one and one-half inches or less in length, and from its great resemblance to wool is frequently used in combination with that staple. About 15,000 bales are annually imported into the United States, and it is claimed that most of it is used by woolen manufacturers to mix in making underwear, hosiery, etc., much of the material being sold as all-woolen goods.

In *commercial usage*, to fibres under 0.98 inch or 25 millimeters in length there has been given the name 'short staple'; 'medium' means from 0.98 to 1.17 inches (25 to 30 millimeters), and 'long' 1.18 to 1.57 inches (30 to 40 millimeters); 'extra,' including those which are 1.58 inches (40 millimeters) or more. The extra and the long in the United States seem to come from Sea Island cotton or some of its hybrids; the short and medium from *Gossypium hirsutum* or *Gossypium herbaceum*.

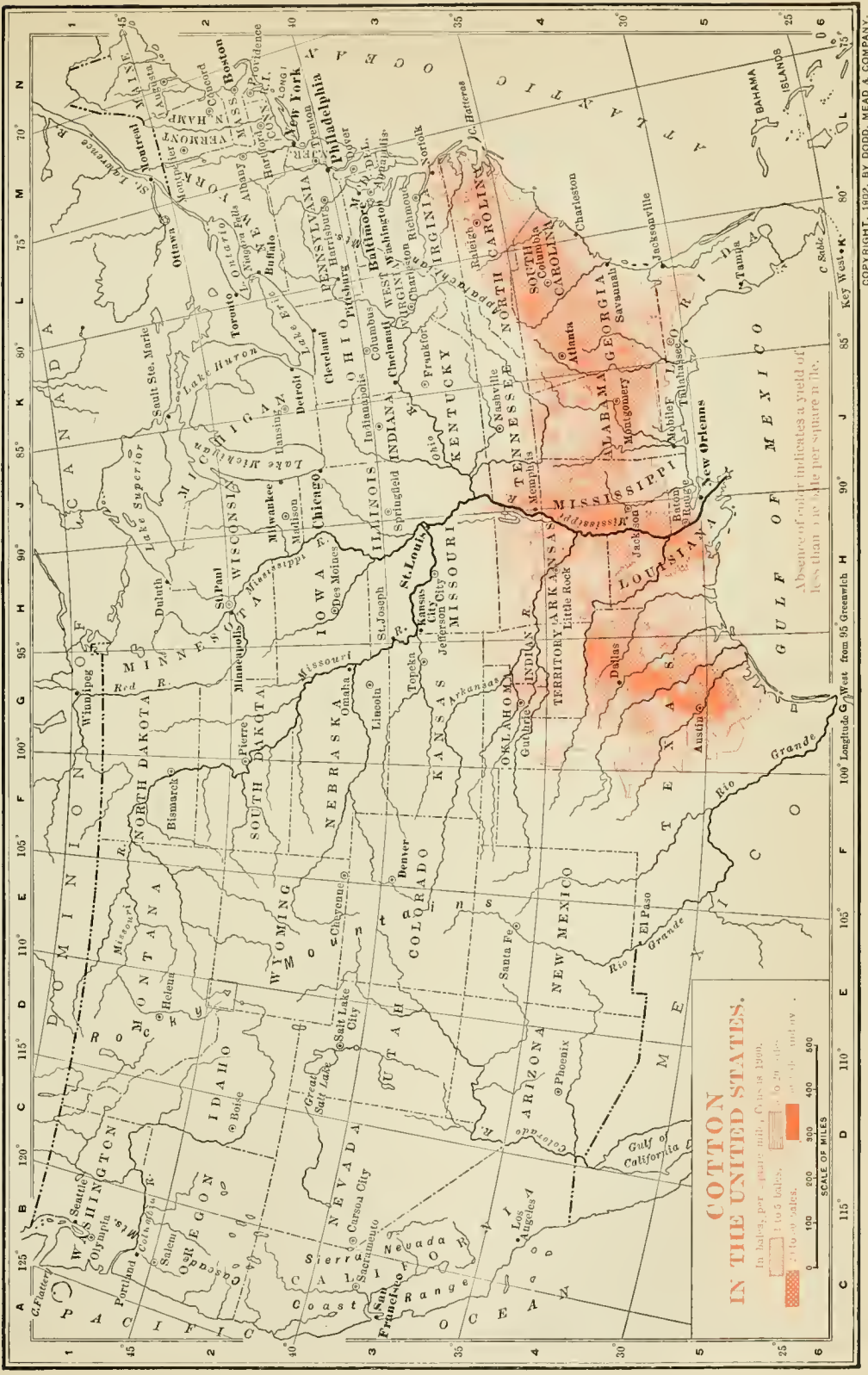
The commercial classification of cotton in New York is as follows: The 'full grades' are fair, middling fair, good middling, middling, low middling, good ordinary, and ordinary. Half grades are designated by the prefix 'strict,' quarter goods by prefixes 'barely,' meaning the point above half grade and the next full grade above, and 'fully,' meaning the mean point between the half grade and the next full grade below. Liverpool high grades are lower, and low grades higher than New York.

CULTIVATION. The plant requires for its best development a peculiar soil and climate. While the method of cultivation is about the same in the various countries where it is grown, that in

the United States is the most perfect. Although the plant is not really an annual, it is treated as such in its cultivation. The land is prepared in winter, the time of beginning varying with the locality. After thorough plowing, and after all frost has gone, the ground is bedded into rows from three to four feet wide, according to situation and the quality of the soil; the seed is sown along the centre of these beds, either in a straight furrow made with a small plow or opener, or in holes twelve to eighteen inches apart. Where artificial fertilizers or cottonseed-meal are drilled in this method of preparation is indispensable. The usual date to begin preparing land is from January 15 in southern Texas to March 5 in South Carolina. Sowing usually commences March 10 to April 15 and continues to May 15; but late spring frosts may delay it longer. The young shoots, which appear in from ten to fifteen days, are weeded and thinned when they have attained a height of two to six inches, say, when the third or first true leaf appears. The average date of bloom is June 5. As a general rule, cotton is a dry-weather plant, heavy rainfall interfering with both the culture and the stand, although an extremely dry spring interferes with the growth. For plowing it is best to have just enough rain to make the soil moist and spongy. When young, the crop flourishes best with warm steamy weather, with an occasional shower until blooming. An excess of rain produces weeds and wood; severe drought stunts the plant, matures it too early, and causes a small, light-stapled crop. Early frost causes the plant to turn brown; cold nights cause many of the plants to die. Lands in hilly or upland districts require more moisture than those lying in the plains and river bottoms. Overflowing often causes injury on bottom and flat prairie lands, but replanting or recuperation often redeems the most hopeless cases. Where, however, overflowing causes 'sanding,' the land is rendered utterly useless for cotton culture that year. The experiment stations in the Southern States have aided in introducing improved methods of cultivating, fertilizing, and handling the crop. Rotation of crops and green manuring have been shown to be of great advantage. From the date of bloom, warm, dry weather is needful, until picking time, which usually commences from July 10 in southern Texas up to September 10 in Tennessee, and continues until frost puts a stop to further growth. During the harvest all available hands are called into full employment. The cotton is gathered into baskets or bags hung from the shoulders of the pickers, and when the crop has been secured it is spread out, dried, and then the fibre separated from the seeds. For long-staple or Sea Island cotton in South Carolina the usual date to begin preparing land is February 1; planting begins April 1 and ends May 1; picking is from August 25 to December 10.

INSECT ENEMIES OF THE COTTON-PLANT. See COTTON-INSECTS.

COTTON DISEASES. There are a number of well-characterized diseases of the cotton-plant, some of which are due to disturbances in the nutrition of the plant, others are caused by fungous attacks, while still others are attributed to the presence of minute worms, called nematodes, in the roots. Attention to the requirements of the plants will correct the first class of diseases. For the fungous troubles but little in the way of prevention



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is known. Among the most important diseases due to physiological causes are those known as the mosaic disease or yellow leaf-blight, and the shedding of bolls. In the first, small areas of the leaves become yellow, giving to the leaf a peculiar checkered appearance. Later these areas turn brown and dry up, leaving the leaf in a more or less ragged condition. At this stage the disease is usually referred to as the black rust. Heavy applications of kainit or similar fertilizer are said to correct this evil. The shedding of the bolls, or their drying up while still attached to the plant, is often a serious trouble. Extreme dry or wet weather causes this disease by interfering with the proper supply of moisture and nutriment furnished the plant through its roots. Among the diseases due to parasitic fungi a few of the most serious and widely distributed may be mentioned. Damping off, soreskin, or seedling rot is caused by *Pythium debaryanum* and a number of other fungi. They attack the young plants at or near the surface of the ground, producing ulcer-like spots, and later rot the plant off. The sunken, ulcer-like spots can be readily seen on the affected stems. Another common disease is anthracnose, due to *Colletotrichum gossypii*. It is a widely distributed fungus that attacks the bolls, stems, and leaves. Upon the bolls small reddish spots appear which later become black. The centre then becomes gray or pink and the spots enlarge in a concentric manner with well-marked zones of color. The boll is killed outright or has its development checked so that the lint is worthless. Upon the stems the fungus is somewhat similar in its behavior, although the spots are not quite so definitely marked. Upon the leaves the disease is not very well characterized. A root-rot is very destructive in some places. Its behavior is so marked as to need no description. It is due to a rather widely distributed fungus that has been called *Ozonium auricomum*. It attacks a number of plants in addition to cotton. Rotation of crops is about the only method of relief known. A leaf-blight (*Sphærella gossypina*) and a mildew (*Ramularia arcota*) are common diseases in the cotton-field, but they seldom occasion much injury.

The most serious fungous disease to which the cotton-plant is subject is the wilt disease, or Frenching, as it is commonly known. It makes its appearance usually in May, when the plants are six or eight inches high. The plants are dwarfed, have an unhealthy appearance, the leaves turn yellow between the veins and their margins dry up. Sometimes plants wilt and die at once, while at other times the progress of the disease is slower and the plant may partly recover. A plant attacked by this disease will show a brownish stained color in the wood when cut across. The cause of the trouble is a fungus recently described as *Neocosmospora vasinfecta*, and the same or a closely related form occurs on the okra and watermelon. Some varieties and individual plants seem less liable to this disease, which attacks the plants through the soil, and it is thought the means for overcoming this trouble lies in resistant plants. This disease, as well as some others, is very much complicated by the presence in the roots of the cotton of nematodes (*Heterodera radiceicola*), minute worms that enter the roots of cotton and a number of other plants, causing a large number of galls to be formed. The plant is injured by the nourish-

ment taken from other parts of the plant to make the galls. This weakens the plant so it is more liable to fungous attack. When nematodes occur in abundance in the field no entirely efficient means of eradication is known as yet.

PRODUCTION AND DISTRIBUTION. The oldest known cotton-producing country is India, where for thirty centuries the plant has been grown and its fibre manufactured. For four hundred years before the Christian Era cotton was well known in what was then the civilized world, the writings of the Greeks and Egyptians plainly indicating the knowledge of the value of this fibre. Columbus found it in the Western world, although not so extensively cultivated as in the East; but during the past fifty years its culture here has distanced in quantity and in quality the produce of the Old World. Down to 1800 the cotton-consumers of Europe depended upon the Indies and the Levant for their raw material; but by 1860, so far had the inventive genius, the superior farming, and the greater energy of the planter of our Southern States pushed the production of the fibre, that they furnished the greater part of the cotton used by Great Britain and the Continent of Europe. From 1858 to 1860 America furnished 79 per cent. of the cotton imported to Great Britain. During our Civil War this dropped to 3½ per cent., rising to 58 per cent. in 1871, and amounting to 80 per cent. in 1900. During the Civil War, when the price of cotton was abnormally high, attempts were made to grow cotton in many countries. The industry flourished there for a while, but it has ceased to be profitable, in Europe, Australia, etc. Russia in her Asiatic possessions has developed cotton-growing greatly in recent years, so that the imports into the empire have fallen off 50 per cent. in the past decade.

COTTON PRODUCTION OF THE WORLD. This is difficult to more than approximate, as a large proportion and amount consumed is produced in uncivilized or in semi-civilized countries, where no accurate record is kept; and in many countries and districts absolutely no data are available—as in China, where soil and climate are favorable and the clothing of the population is largely of cotton, yet the extent of its cultivation is a close secret; and in some parts of India, where the production can be estimated only by the amount in sight and the known or assumed requirements for dress. The amount produced in the vast unknown continent of Africa is even more of a mystery, although native cottons form there a large proportion of the dress.

The commercial crop for the year 1898-99 was 13,110,000 bales of 500 pounds each. This includes the total crop of the United States and the known imports into Europe and America from other cotton-producing countries. The product was divided as follows: United States, 11,189,000 bales; Egypt, 1,243,000 bales; India, China, etc., 607,000; Brazil, 23,000 bales; Peru, West Indies, etc., 30,000; and Turkey, Asia Minor, etc., 18,000. The domestic consumption in those countries from which only the exportations are given would add very materially to the total production of the world. India leads in the domestic consumption of cotton among those countries not reporting, and in 1900 about 1,100,000 bales were consumed by the local mills. According to Latham, Alexander & Co., the total production for 1900 was: United States, 9,137,000

bales; East Indies, etc., 1,562,000 bales; Egypt, 1,228,000 bales; Brazil, etc., 250,000 bales, or a total of 12,177,000 bales of 500 pounds each.

COTTON IN THE UNITED STATES. The first authentic record of cotton cultivation in the United States was at Jamestown, Va., in 1607. Sea Island cotton was introduced from the West Indies in 1786. The first exportation was in 1747, when eight bags were sent to England, the first shipment of any importance being 2000 pounds in 1770. In 1791, 189,316 pounds were exported; Whitney's invention of the saw gin in 1793 raised this amount to 17,789,803 pounds by

The accompanying Table No. 1, taken from *Bulletin No. 58*, census of 1900, gives the cotton crop in the United States by States, according to censuses of 1870, 1880, 1890, and 1900, for the crops of the preceding year. The bale measurement of 1890 was 477 pounds; in 1880 it was 433 pounds; in 1870 it was 440 pounds. It is interesting to note the States in which cotton has at some time been cultivated. The *Bulletin* states that "early settlers north of the Ohio River planted cotton for domestic uses between 1749 and 1780. The census for 1860 gave for Illinois 1482 bales, or 659,490 pounds of cotton.

TABLE I.—COTTON GROWN IN THE UNITED STATES IN THE YEARS 1869, 1879, 1889, AND 1899 (IN BALES)

STATE	1869	1879	1889	1899		Per ct. of Total	
				Actual No.	Equivalent No. in 500 lb. bales	1870	1900
Alabama.....	429,482	699,654	915,210	1,103,690	1,078,519	14.2	11.5
Arkansas.....	247,968	608,256	691,494	719,453	705,583	8.2	7.6
California.....	34	.....	.....	.....	.....	.....	.....
Florida.....	39,789	54,997	57,928	56,821	49,359	1.3	.5
Georgia.....	473,934	814,441	1,191,846	1,296,844	1,251,060	15.8	13.2
Illinois.....	465	.....	.....	.....	.....	.....	.....
Indiana.....	3	.....	.....	.....	.....	.....	.....
Indian Territory.....	.....	17,000	34,115	160,324	143,608	.....	1.5
Kansas.....	7	.....	212	121	121	.....	.....
Kentucky.....	1,080	1,367	873	84	79	.....	.....
Louisiana.....	350,832	508,569	659,180	708,508	700,352	11.7	7.5
Mississippi.....	564,938	963,111	1,154,725	1,264,048	1,237,666	18.8	13.2
Missouri.....	1,246	20,318	15,856	19,377	20,275	.1	.2
Nevada.....	106	.....	.....	.....	.....	.....	.....
North Carolina.....	144,935	389,598	336,261	473,155	440,400	4.8	4.7
Oklahoma.....	.....	.....	425	84,035	71,983	.....	.8
South Carolina.....	224,500	522,548	747,190	876,545	837,105	7.5	9.0
Tennessee.....	181,842	330,621	190,579	215,175	211,641	6.0	2.3
Texas.....	350,628	805,284	1,471,242	2,658,555	2,609,018	11.6	27.9
Utah.....	22	.....	.....	.....	.....	.....	.....
Virginia.....	183	19,595	5,375	9,239	8,622	.....	.1
West Virginia.....	2	.....	.....	.....	.....	.....	.....
Total.....	3,011,996	5,755,359	7,472,511	9,645,974	9,345,391	100	1009

* Calculated on basis of 500-lb. bales.

1800. The production reached 2,160,000,000 pounds in 1860, and amounted to 4,506,000,000 pounds in 1895 (9,467,000 bales reckoned at 484 lbs. net each). Cheapening the processes of cultivation and cleaning, and increase of acreage, have so lowered the cost of the fibre that while the average price in Liverpool was 1s. 6d. (say 36 cents) per pound in 1793, it was 5¾d. (say 11½ cents) in 1851; averaging 7d. (14 cents) for the five years ending 1861. In 1867 there was a decline from the high prices consequent upon the Civil War to 7¾d. (14¾ cents), but in a few months it reached 1s. 1d. (26 cents). In 1890 it ranged from 5-9-16d. to 6¾d. in Liverpool, from 10¼ cents to 12¾ cents in New York; while in 1899 the range of price in New York was from 5-5-16 cents to 6½ cents, with an average of about 6 cents per pound, the 1900 values being considerably higher.

The acreage in cotton of the ten cotton-growing States for the season of 1899-1900 was as follows:

STATE	Aeres
North Carolina.....	1,220,000
South Carolina.....	2,212,000
Georgia.....	3,288,000
Florida.....	149,000
Alabama.....	2,883,000
Mississippi.....	2,784,000
Louisiana.....	1,179,000
Texas.....	6,642,000
Arkansas.....	1,726,000
Tennessee.....	816,000
All others.....	622,000
Total.....	23,521,000

Stimulated by the high prices following the Civil War, the cultivation of cotton was conducted to a limited extent in California, Illinois, Indiana, Nevada, Utah, and West Virginia. With the coming of low prices, cotton culture gradually disappeared from those sections not peculiarly adapted to it, and censuses after 1870 credited none to California, Illinois, Indiana, Nevada, Utah, or West Virginia. Natural selection continues to eliminate the industry from sections less favored by climatic conditions. To illustrate: Kentucky is credited by the censuses of 1880 and 1890 with 1367 and 873 bales respectively, but the census of 1900 finds in this State only 84 commercial bales. The loss in those States lying along the northern border of the cotton belt is more than offset by the increase found in the territory west and southwest of the Mississippi River. According to the Eleventh Census 2,872,524 bales, or 38 per cent. of the entire American crop of 1889, was grown in that region, while in the census of 1900, in the same territory, the production reaches 4,250,940 bales, or 45 per cent. of the whole crop."

The value of the exports of cotton from the United States between the years 1895-99 averaged \$213,378,243 a year. The United Kingdom took 49 per cent.; Germany, 22 per cent.; France, 11 per cent.; Italy, 5.2 per cent.; Spain, 3.8 per cent.; Belgium, 1.8 per cent.; Japan, 1.7 per cent.; Russia, 1.6 per cent.; and Canada, 1.5 per cent.

The number of spindles in Europe and the United States, September 30, 1900, and the consumption of cotton for the season of 1898-99, are as follows:

COUNTRIES	Number of spindles, round numbers	Annual consumption bales of 500 lbs.
Great Britain.....	45,400,000	3,519,000
Continental Europe.....	32,500,000	4,836,000
United States.....	* 18,100,000	3,582,000
India.....	4,728,000	† 1,675,000
Total.....	100,728,000	13,612,000

* Spindles in Northern States, 14,150,000.

" " Southern " 3,950,000.

† Bales of 392 pounds.

COST OF PRODUCTION. A great many estimates have been published as to the cost of production of a crop of cotton. None of these are accurate or of value, as so many factors must be considered, such as different soils, methods of cultivation, season, etc. According to Hammond, the cost of producing Sea Island cotton in 1880 ranged in South Carolina from 15 to 21 cents a pound; in Georgia, 50 cents per pound of lint. The cost of producing upland cotton varied within wide limits. In North Carolina in 1880 it ranged from 6.2 cents in the Piedmont region to 7.3 cents in the Pine levels. In 1892 the range was from 3.5 to 6.6 cents. The cost in South Carolina in 1880 ranged from 6.91 to 8 cents; in 1892 it was 6.6 cents for the Pine Hills region; in 1893, from 5 to 14 cents dependent upon the nature of the soil. In Georgia the crop of 1880 was estimated at from 3 to 6 cents for the Pine Hills region and 8 to 10 cents in other regions; the crop of 1892 averaged 7.5 cents per pound; that of 1893, 6.75 cents. In Alabama, in 1880, the crop cost from 3 to 8 cents per pound; in 1892, from 4.5 to 7.75 cents; and in 1893 it averaged 8 cents. In Mississippi the cost varied from 4 to 11 cents in 1880, and from 4 to 8.4 cents in 1893, dependent upon the producing region. In Louisiana the cost varied in 1880 between 6.8 and 7.4 cents, and in 1893 between 4.9 and 7 cents. In Arkansas in 1880 the range was from 6.2 to 7 cents per pound; in 1893 from 4 to 7 cents. In 1880 the Texas crop cost from 3 to 9 cents per pound, with averages of from 4.5 to 6.5 cents in the

principal producing regions. In Tennessee the cost of the 1880 crop was from 3.5 to 10 cents per pound, that of 1893 averaged 7 cents. The average production for the United States in 1900 was about 200 pounds per acre.

MANUFACTURE. The process of transforming cotton from its raw condition after picking into the thread or cloth that is such an essential of daily life is one which involves many different operations. It must first be cleaned to remove sand, dust, and other foreign substances. It then contains about two-thirds of its weight in seeds, which must be removed.

Cotton-Ginning.—Before Eli Whitney's invention of the cotton-gin, the removal of the seeds by hand was so difficult a task that very little cotton was raised. It would take one person two years to turn out an average bale of cotton, three to fifteen of which are produced by one machine in one day. Before the Civil War the gins were run chiefly by mule-power, which, when operated in connection with slave labor, was cheaper than steam. Whitney's cotton-gin, known as the saw gin, may be briefly described as a series of circular saws with fine teeth, revolving with an arc of their circumference projecting through a guide into a receptacle for seed cotton. These saws tear the lint from the seed and carry it through the guide. It is removed from the saws by a brush and carried to a condenser. Great care must be exercised not to injure the cotton (1) by having the saws too close to the bars of the grate, so as to rub; (2) by having them revolve too fast; or (3) by having the teeth too sharp. See Brooks, *Cotton* (New York, 1898). The roller gin is growing in favor among cotton-producers, especially for the long-staple or Sea Island cotton, and in the United States and Egypt all long-staple cotton is ginned in this way. It removes the seed with only one-fifth the rapidity of the saw gin, but it does not injure the fibre. In a primitive form it has been used in Egypt and India for many centuries. It consists of two rollers, revolving in opposite directions, between which the cotton is passed and the smooth, hard seeds thrown off. Both the saw gin and roller gin have been much modified and their effectiveness increased by successive improvements.

In *Bulletin No. 58*, on Cotton-Ginning, Twelfth United States Census, Daniel C. Roper divides

TABLE II.—COTTON-GINNERIES IN THE UNITED STATES IN 1899 (FROM TWELFTH UNITED STATES CENSUS)

STATE	NUMBER OF GINNERIES				Average number of months in operation for crops of 1899
	Total	The Public only	The Plantation only	Both Public and Plantation	
Alabama.....	4,034	792	391	2,851	3
Arkansas.....	2,630	668	133	1,829	3
Florida.....	236	73	10	153	3
Georgia.....	4,729	696	572	3,461	4
Indian Territory.....	297	215	6	76	4
Kansas.....	2	1	....	1	2
Kentucky.....	2	1	....	1	1
Louisiana.....	2,148	190	361	1,597	3
Mississippi.....	3,976	519	580	2,877	4
Missouri.....	56	40	....	16	3
North Carolina.....	2,573	431	278	1,864	3
Oklahoma.....	133	109	....	24	3
South Carolina.....	3,368	298	391	2,689	3
Tennessee.....	334	255	45	534	3
Texas.....	4,514	2,165	100	2,249	4
Virginia.....	88	15	6	67	3
Total.....	29,120	6,468	2,863	20,289	3

cotton-ginneries into three general classes: Those conducted exclusively for the public, those conducted exclusively for the plantation, and those conducted for both the public and plantation. Table II., preceding, shows the number of all classes by States in the United States. The *Bulletin* states that "the rapidity with which the private or plantation ginneries have been supplanted by public, and more modern equipments, is noteworthy. Through inquiries of the census of 1880, covering the power and machinery of cotton-ginning establishments, it was ascertained that a large percentage of the crop of 1879 was handled by ginneries of a private character. The motive power of these ginning and baling plants consisted of horses or mules, and each had a daily capacity of from three to five bales. The general introduction of steam-power brought economic methods that have crowded out primitive horse-ginneries to such an extent that they are now curiosities." As shown in the table, there are in the United States 29,620 cotton-ginneries, of which 2863, or less than 10 per cent., are reported as ginning exclusively for the plantation. *Bulletin* No. 98 of the Twelfth United States Census also deals with cotton-ginning, with particular reference to the crop of 1900, and contains an historical and descriptive sketch of the methods of preparing raw cotton for the market.

Baling.—The cotton having been separated from the seed, the next step is to pack it in bales, for shipment. Different methods of baling prevail among the cotton-producing countries. The American product, as put up in the old-fashioned tortoise-back bales, has the reputation of being the worst-baled cotton in the world. East Indian cotton is shipped in cubical bales, weighing about 400 pounds, covered with thick Indian hemp and held together with strong iron bands. The Egyptian bale weighs about 700 pounds, is a little thicker and not so long as the American, and has eleven, instead of seven or eight, bands around it. Brazilian cotton comes in very light bales, weighing only 200 pounds, which are tied with trailing vines. In the cotton States of America, the cotton which is not consumed by the Southern mills is shipped to the exporting city, by rail, steambot, or wagon. It is there graded by the exporter, who fastens a tag to each bale, and also to a sample taken from it. It is from these labeled samples that the foreign manufacturer makes his purchases. The bales are then subjected to enormous pressure, usually by the transportation company, a standard bale weighing 500 pounds. During its progress from the farm to the factory, a bale of cotton is given a series of brands, by the farmer and the ginmery, as well as the exporter, so that fraud can easily be traced. One of the objections to the American baling methods, however, is that the covering becomes so torn that the marks on it cannot be deciphered.

The manner in which American cotton is generally baled and pressed for transportation to the markets and mills is not only needlessly expensive and wasteful, but fails to protect the cotton from damage and theft. The bales are covered with jute cloth, made of thread so coarse and loosely woven that, while it adds unnecessarily to the weight of the bale, it does not protect the cotton. The bales are held together by steel bands, which still further increase the weight. The weight of the bagging and ties on a

bale weighing 500 pounds is about 23 pounds. Besides the increased freight rates due to this bulky method of baling, the necessity of a second pressing, and the bad condition in which the cotton reaches the factory, a more grave defect is its excessive inflammability, resulting in high insurance charges. So great is this risk that on some passenger steamers cotton is not carried, on account of the danger of fire. An illustration of this danger was afforded by the terrible fire which occurred on the docks of the North German Lloyd Steamship Company at Hoboken, N. J., on June 30, 1900. The fire started in some unknown manner in a lot of cotton-bales and spread with such rapidity that efforts to check it were unavailing. The loss of property caused by this cotton fire has been estimated variously at from \$4,000,000 to \$6,000,000, and the loss of life was about 200 persons.

Within the past few years the cylindrical bale has been growing in favor among all classes of cotton-dealers. The American Cotton Company makes a bale four feet long and two feet in diameter, weighing over 35 pounds per cubic foot. The cotton is pressed gradually, so as not to injure the fibre, and is in the form of a continuous lap or roll. Since the air is pressed out of the cotton, it has no tendency to expand, and the covering is only sufficient to keep the cotton clean. The heavy bagging and ties are entirely dispensed with. The cotton is compressed as fast as ginned and is shipped direct from the gin-house to the warehouse or mill. The cylindrical bale of the Planters' Compress Company is 36 inches long, 18 inches in diameter, and weighs 250 pounds. This bale is held together by wires passing from end to end through a small opening in the centre. It is covered with cotton duck, and the weight of the cloth and wire is about three pounds per bale. Most satisfactory tests have been made with each of these types of bales, showing that they are both fire and water proof. The other objections to the old-fashioned methods of baling are also met by the cylindrical bales described.

Spinning.—When the cotton-bales are received at the factory, the cotton from the different bales is first mixed in order that the yarn produced may be of uniform quality. It is next submitted to a process of opening and picking that loosens the fibres which became closely packed together when the bale was pressed. Then follow the processes of *carding*, *drawing*, *slubbing*, *roving*, *spinning*, and *doubling*, by which the cotton-fibre is reduced by successive stages from a web or sheet into cotton yarn. The process of carding is described under that title. Its object, besides cleaning the cotton of any foreign substances still adhering, is to reduce the lap into a thin fleece and then contract it into a ribbon or sliver. The sliver, after being doubled so that inequalities in the single slivers are counterbalanced, is put through a drawing machine, consisting of successive pairs of rollers, each of which revolves more rapidly than the preceding one, and which reduces the sliver to a finer and finer thread. By slubbing and roving, the process of attenuation is continued, the thread in each case taking the name of the machine through which it has just passed. The thread is also twisted, and when it leaves the roving machine it is strong enough to be wound on a bobbin. Spinning is the concluding process, and in this the thread is given

the requisite firmness and twist. Doubling is the combining of two or more threads into a single cord. Every step in the manufacture of cotton yarn has for its object (1) the removal of finer and finer impurities, (2) the attenuation and strengthening of the thread, (3) correcting the mistakes of the preceding process. The whole process is described in more detail in the general article on SPINNING.

The thread may be subjected to the additional processes of *gazing* and *polishing*. The object of gazing is to singe off all the loose fibres and so produce a very smooth yarn. This is accomplished by passing the thread through a very fine jet of gas, as it is wound from one bobbin to another. The yarn is polished by applying a sizing made of starch, beeswax, or other materials. This not only gives the yarn a gloss, but increases its strength and weight. The process of weaving cotton into cloth does not differ materially from that of silk and wool, and is treated in the general article on WEAVING.

The bulk of the world's cotton is shipped into foreign countries and often across the ocean twice, once to the factories to be transformed into yarn and cloth, and again, perhaps, back to the very region where it was first raised, in the form of cotton goods. The best example of this fact is offered by the United States, which raises nine-tenths of the world's cotton, yet exports less cotton goods than the republic of Switzerland, which raises not a pound of cotton and has not even a seaport. Of course the United States is an enormous consumer of cotton, and this fact must be remembered in considering the extent of her export trade. Obviously the amount of cotton goods imported, and the amount produced and consumed at home, are also important factors.

exported and in the actual amount produced. It is interesting to note that this enormous industry is concentrated about Lancashire, in a district whose area is about 50 per cent. greater than that of the State of Rhode Island. In the United States, the most marked development of the last decade of the nineteenth century is the relative importance of Southern factories, situated in the very locality where cotton is produced. In this period the number of spindles increased 245 per cent. and became nearly one-third of the whole number in the country. Other industrial conditions besides the nearness to the cotton crop produced this growth, chief of which has been the general industrial awakening experienced by the South. Capital, however, in this section, has shown greater progress than labor, so that the latter is still cheap; a working day is long, and there are comparatively few labor laws restricting the age, sex, and other conditions of labor.

TABLE III.—VALUE OF THE WORLD'S EXPORTS OF COTTON GOODS BY COUNTRIES
(From *The World's Export Trade*)

COUNTRY	1897	1898	1899
United States.....	\$21,037,678	\$17,024,092	\$23,566,914
England.....	310,910,727	315,418,260	328,325,157
Germany.....	47,298,930	47,961,144	53,637,776
France.....	23,695,504	25,521,591	32,081,095
Austria-Hungary.....	4,268,619	3,654,952	4,142,910
Italy.....	5,767,075	9,700,093	10,747,854
Russia.....	2,089,800	1,522,638	*1,500,000
Switzerland.....	23,959,001	24,503,083	25,000,000
Belgium.....	4,823,395	5,192,894	5,440,746
Japan.....	7,981,285	11,357,281	16,215,960
Total.....	\$451,832,014	\$461,836,028	\$500,658,412

* Estimate.

TABLE IV.—NUMBER OF SPINDLES IN COTTON-MILLS
(Compiled by A. P. Shepperson and published in *Cotton Facts*)

SEASON OF	Great Britain	Continental Europe	Northern United States	Southern United States	Total United States	India
1888-89.....	43,500,000	24,885,000	12,700,000	1,360,000	14,060,000	2,763,000
1889-90.....	43,750,000	25,460,000	12,800,000	1,605,000	14,405,000	3,274,000
1890-91.....	44,750,000	26,035,000	12,900,000	1,740,000	14,640,000	3,352,000
1891-92.....	45,350,000	26,405,000	13,250,000	1,950,000	15,200,000	3,402,000
1892-93.....	45,270,000	26,850,000	13,450,000	2,100,000	15,550,000	3,576,000
1893-94.....	45,190,000	27,350,000	13,500,000	2,200,000	15,700,000	3,650,000
1894-95.....	45,400,000	28,250,000	13,700,000	2,400,000	16,100,000	3,810,000
1895-96.....	44,000,000	29,350,000	13,800,000	2,850,000	16,650,000	3,933,000
1896-97.....	44,500,000	30,350,000	13,900,000	3,250,000	17,150,000	4,066,000
1897-98.....	44,900,000	31,350,000	13,900,000	3,550,000	17,450,000	4,260,000
1898-99.....	45,400,000	32,500,000	14,150,000	3,950,000	18,100,000	4,728,000
1899-1900.....	45,400,000	33,000,000	14,400,000	4,700,000	19,100,000	4,945,000
Increase in 10 years.....	1,900,000	8,115,000	1,700,000	3,340,000	5,040,000	2,182,000
Per cent. of Increase....	4 $\frac{1}{2}$	32 $\frac{1}{2}$	13 $\frac{1}{5}$	245 $\frac{1}{5}$	35 $\frac{1}{2}$	79

Table III. gives the value of the world's export trade in cotton, by countries, for 1897, 1898, and 1899. The table is taken from a pamphlet, entitled *The World's Export Trade*, published by the Philadelphia Commercial Museum, April, 1900. Of more value, however, as showing the actual extent of the cotton industry, including both home and foreign consumption, and its geographical tendencies as well, are the Tables IV. and V., showing the number of cotton-mills and spindles, the amount consumed, and the value of the output. By studying these tables, certain facts and tendencies in the cotton trade are apparent. Great Britain is and always has been at the head of the cotton trade, both in the amount

During the closing years of the nineteenth century the manufacture of cotton was much advanced in China and Japan. In China cotton has been made into cloth since 1260, and for four centuries it usurped the place of silk. Steam-power was introduced into Chinese cotton-factories in 1865-67, and into Japan in 1889. Great difficulty has been experienced in both China and Japan in getting laborers. There is no factory legislation in either country limiting the hours of labor, and in China children begin to work at a very early age. The working day is eleven or more hours long, and the factories run seven days in the week. Labor is also very cheap, as estimated by the amount of money paid for a

day's work, which averages from 10 to 15 cents; but the standard of intelligence and faithfulness among operatives is so low that, measured by the amount and quality of the product, the real cost of labor is high. In Japan, it is particularly hard to keep steady employees. The girls are used to the freedom and out-of-door life of the country and will not stay long at their situations, so that mill operators are constantly hampered with green hands. In Japan the weaving of cotton and other fabrics is still largely a household industry. In 1896, according to the French consul at Yokohama, 660,408 dwellings or establishments contained 949,123 looms, at which 1,043,866 persons were engaged in weaving. The yarn used in this household art is largely factory-spun, thus increasing rather than diminishing the demand for cotton-factories.

Statistics.—Shepperson, *Cotton Facts* (New York, annually); *Statistical Abstract of the United States* (published annually); United States Department of Agriculture, Office of Experiment Stations, *Bulletin 33*, and Publications of the Statistical Division and Section of Foreign Markets, *Twelfth United States Census* (Washington, 1902). See COTTONSEED AND ITS PRODUCTS; SPINNING; WEAVING; MUSLIN.

COTTON, ARTIFICIAL. A material made in Germany from the wood of the fir-tree, which is reduced to thin shavings. These are washed, then steamed for ten hours, after which they are treated with a strong solution of sodium lye and then heated under great pressure for thirty-six hours. The wood is then said to be changed to pure cellulose. To give the material greater resisting power, castor-oil and gelatin are added.

TABLE V.—COTTON CONSUMPTION OF THE WORLD, IN 500-POUND BALES

YEAR	Great Britain	Continent of Europe	United States	India	All Others	Total World
1886-87.....	2,955,000	2,912,000	1,238,000	570,000	.....	8,375,000
1887-88.....	3,073,000	3,037,000	2,024,000	617,000	.....	8,751,000
1888-89.....	3,016,000	3,256,000	2,148,000	697,400	.....	9,117,000
1889-90.....	3,227,000	3,432,000	2,185,000	791,000	.....	9,635,000
1890-91.....	3,384,000	3,631,000	2,367,000	924,000	150,000	10,456,000
1891-92.....	3,181,000	3,619,000	2,576,000	914,000	160,000	10,450,000
1892-93.....	2,866,000	3,661,000	2,551,000	918,000	220,000	10,216,000
1893-94.....	3,233,000	3,827,000	2,264,000	959,000	250,000	10,533,000
1894-95.....	3,250,000	4,030,000	2,743,000	1,074,000	300,000	11,397,000
1895-96.....	3,276,000	4,160,000	2,572,000	1,105,000	419,000	11,532,000
1896-97.....	3,224,000	4,368,000	2,738,000	1,004,000	546,000	11,880,000
1897-98.....	3,432,000	4,628,000	2,962,000	1,141,000	726,000	12,889,000
1898-99.....	3,519,000	4,784,000	3,553,000	1,297,000	845,000	13,998,000
1899-1900.....	3,334,000	4,576,000	3,856,000	980,000	789,000	13,535,000

Japan had 200,000 spindles in operation in 1889, and 1,358,125 spindles in 1899. Japan consumed 99,375 bales of cotton in 1890, and 644,818 bales in 1898. China had 570,000 spindles in operation in 1899. It is estimated that on July 1, 1900, the world's working spindles numbered 105,000,000.

BIBLIOGRAPHY. *Description and cultivation.*—True, "The Cotton Plant," in *United States Department of Agriculture Office, Experiment Stations, Bulletin 33* (Washington, 1896); Wilkinson, *Story of the Cotton Plant* (New York, 1899); Lecompte, *Le coton: monographie culture, histoire économique* (Paris, 1900); Hohnel, *Ueber die Baumwolle* (Vienna, 1893); Parlatore, *Le specie dei cotonei* (Firenze, 1866); Todaro, *Relazione sulla cultura dei cotonei in Italia...* (Rome, 1878); Mallet, *Cotton: the Chemical, Geological and Meteorological Conditions for Its Successful Cultivation* (London, 1862); Bowman, *Structure of the Cotton Fibre* (Manchester, 1881); Monie, *The Cotton Fibre: Its Structure* (Manchester, 1890); Tompkins, *Cotton, Cotton Oil, Cotton Planting, Harvesting...* (Charlotte, N. C., 1901); Dana, *Cotton from Seed to Loom* (London, 1878).

Manufacture and Uses.—Ashworth, *Cotton: Its Cultivation, Manufacture and Uses* (Manchester, 1858); Ellison, *Cotton Trade of Great Britain* (London, 1898); Brooks, *Cotton and Its Uses, Varieties, Structure of Fibre...* (New York, 1898); Hammond, *The Cotton Industry* (New York, 1897); Latham, Alexander & Co., *Cotton Movement and Fluctuations* (New York, 1899); Royle, *Culture and Commerce of Cotton in India* (London, 1851); Marsden, *History of Cotton Manufacture* (London, 1895); Posselt, *The Structure of Fibres, Yarns and Fabrics* (Philadelphia, 1892).

after which it is ready to be spun into thread and reeled.

COTTON, CHARLES (1630-87). An English translator and poet, said to have been educated at Cambridge. He was a friend of Izaak Walton, to whom he addressed several poems, and to the fifth edition (1676) of whose *Compleat Angler* he contributed as the 'second part' an essay on fly-fishing. His works, nearly all in verse, include a translation of Corneille's *Horace* (1671); the *Life of the Duke d'Espernon* (1670); *The Fair One of Tunis*, published anonymously (1674); *The Scarronides, or Virgil Travestie* (1664); *The Voyage to Ireland*, and *The Wonders of the Peak* (1681). Cotton was a famous angler and was horticulturist enough to write an excellent *Planters' Manual* (1675). Some of his poems have been much admired for their sweetness and directness of style. Wordsworth and Lamb particularly praised his *Ode to Winter*. His best work, the English version of Montaigne's *Essays* (1685, and frequently since), places him among the greatest of translators.

COTTON, CHARLES STANHOPE (1843—). An American naval officer, born in Milwaukee, Wis., and educated at the Naval Academy. In 1861 he entered active service, and participated in several of the principal naval engagements of the Civil War. He was on the frigate *Saint Lawrence* when that vessel captured the *Petrel* (July 28, 1861), and took part in the fight between the *Merrimac* and the *Monitor* (March, 1862). He also participated in the battle of Mobile Bay, and soon after the close of the war was appointed lieutenant-commander. During the Spanish-American War he was in command of the auxiliary

cruiser *Harvard*, and after the war he became commandant of the Navy-yard at Norfolk, Va.

COTTON, GEORGE EDWARD LYNCH (1813-66). An English divine and educator. He was born at Chester and educated at Cambridge. From 1837 to 1852 he taught at Rugby, being the 'young master' mentioned in *Tom Brown's School Days*. He was for six years principal of Marlborough College, and in 1858 was made Bishop of Calcutta. In that office he founded many schools and effected great improvement in the education of the poorer classes of the Anglo-Indian population.

COTTON, JOHN (1585-1652). An eminent Puritan divine, known as 'The Patriarch of New England.' He was born in Derby, England, and was educated at Trinity College and Emmanuel College, Cambridge, at the latter of which he was successively a fellow, head lecturer, dean, and catechist. Inclining toward Puritanism, he left Cambridge about 1612, and for the next twenty years, with one short intermission, he had charge of the Church of St. Botolph's, at Boston, in Lincolnshire, where he had an extraordinary influence over his congregation, gained a wide reputation for learning and godliness, and trained many young men for the ministry. When Archbishop Laud became primate of England (in 1633), Cotton was summoned to appear before the Court of High Commission, but escaped the pursuivants sent to apprehend him, and, after lying in concealment for some time in London, embarked for Boston, New England (which had been named in compliment to him), where he landed in September, 1633. Almost immediately thereafter he was chosen as teacher of the First Church in Boston, of which the Rev. John Wilson was then pastor, and he continued to act in this capacity until his death. Here, as in England, he had a wide reputation for learning and piety, and soon came to wield a powerful influence over affairs both ecclesiastical and secular in New England, and especially in Massachusetts. According to William Hubbard (q.v.), a contemporary historian, whatever he "delivered in the pulpit was soon put into an order of court . . . or set up as a practice in the Church," and the enthusiastic Cotton Mather, speaking of his learning, says that he was "a most universal scholar, and a living system of the liberal arts, and a walking library." "He was," says Tyler, "the unmitred pope of a pope-hating commonwealth." He took an active part in the Antinomian controversy, first supporting and afterwards opposing Anne Hutchinson (q.v.), and conducted an extended controversy with Roger Williams, whose expulsion from Massachusetts he approved. He was a voluminous writer and published as many as fifty volumes, the most important of which are: *Set Forms of Prayer* (1642); *The Keys to the Kingdom of Heaven and the Power Thereof* (1664); *The Bloody Tenent Washed and Made White in the Blood of the Lamb* (1647), written in answer to a letter from Roger Williams; *A Brief Exposition upon Ecclesiastes; A Brief Exposition upon Canticles; A Treatise of the Covenant of Grace as It Is Dispensed to the Elect Seed; A Treatise Concerning Predestination*; and the famous catechism, entitled *Spiritual Milk for Babes, Drawn Out of the Breasts of Both Testaments, Chiefly for the Spiritual Nourishment of Boston Babes in Either England* (1646). A part of the controversy between him and Roger Wil-

liams may be found in the *Publications of the Narragansett Club*, vols. i. and ii. (Providence, 1866-67). Consult: McClure, *The Life of John Cotton* (Boston, 1846); Norton, *Abel Being Dead, Yet Speaketh: or, the Life and Death of That D deservedly Famous Man of God, Mr. John Cotton* (London, 1658; republished, Boston, 1834); an interesting sketch in Mather, *Magnalia* (London, 1702); and a critique of Cotton's writings in Tyler, *A History of American Literature* (New York, 1878).

COTTON, NATHANIEL (1705-88). An English physician and poet, the friend of Young, author of *Night Thoughts*, and of the poet Cowper, whom he cared for in 1763-65 in his sanatorium, or, as he rather grandiloquently styled it, 'Collegium Insanorum,' at Saint Albans, Hertfordshire, where he treated mental diseases with success. His *Visions in Verse* (1751) is his best known volume, and among his shorter poems, "The Fireside," and "To a Child Five Years Old," are still found in anthologies.

COTTON, SIR ROBERT BRUCE (1571-1631). A distinguished English antiquarian, founder of the Cottonian Library, now in the British Museum. After his education at Westminster School under the famous Camden, and at Cambridge, where he took a B.A. degree in his sixteenth year, he began those archaeological pursuits which made his name famous, and which proved of immense value to historians. As the dissolution of the monasteries, about half a century before, had dispersed many valuable collections of manuscripts among private persons, Cotton sought out and purchased these documents wherever practicable. On account of his ability and knowledge, he was frequently consulted by ministers of State on difficult constitutional points and international questions. In 1600, at the request of Queen Elizabeth, who desired antiquarian authority on the matter, he wrote *A Brief Abstract of the Question of Precedency Between England and Spain*. King James, who knighted him in 1603 and gave him a baronetcy in 1611, employed him to vindicate the conduct of his mother, Mary, Queen of Scots, and also to examine whether the Roman Catholics, on account of whom some alarm was then felt, should be imprisoned or put to death. Cotton advocated tolerance. His intimacy with the Earl of Somerset led him to be suspected of complicity in the death of Sir Thomas Overbury, and in consequence he was imprisoned for about eight months. In 1629 a tract entitled *A Project How a Prince May Make Himself an Absolute Tyrant* was obtained from his library, the tendency of which Charles I. and the Star Chamber considered dangerous to the liberty of the State. His library was accordingly declared unfit for public inspection, and he himself was denied all use of it. Depression at this edict caused his death, less than two years afterwards. His son, Sir Thomas (1594-1662), regained possession of the library, and his grandson Sir John (1621-1701), and great-grandson Sir John (1679-1731), added to it considerably. The latter bequeathed it in public trust to the nation. In 1730 the library was lodged with the royal collection in Ashburnham House, Westminster. The following year a fire occurred in which 114 out of 958 MS. volumes were reported as "lost, burned, or entirely destroyed; and 98 damaged so as to be defective." Fortunately, a great number of these injured volumes were skillfully restored, so that the library

now consists of nearly 900 volumes, of which, says Mr. Edwards in his *Memoirs of Libraries*, "nearly 200 are State papers of the highest value. They include a vast series relating to the diplomatic intercourse between England and almost every State of Europe, extending from the reign of Edward III. to that of James I. A large proportion of these documents consist of the original letters of sovereigns and of statesmen. Even those papers which are not original have a high degree of authority as coeval transcripts." The Cottonian Library was transferred to the British Museum (q.v.) in 1757. In addition to the MSS., the collection includes many valuable coins and antiquities. Among Cotton's works may be mentioned, in addition to those referred to above: *Povver of the Pecres and Comons of Parliament in point of Judicature* (1640); *Cottoni Postuma—Choeic Pieces of that Renowned Antiquary* (1672); *Divers Short Picces Exposed to Publick Light by J. Howell* (1679); "Speech before the Privy Council touching the Alteration of Coyn," in Shaw, *Select Tracts and Documents* (1896). Consult, also: *Calendars of State Papers* (London, 1591-1631); *Parliamentary Journals* (London); Planta, *Catalogue of the Manuscripts in the Cottonian Library* (London, 1802); Smith, *Catalogue* (Oxford, 1696), containing a memoir: Kippis, "Robert Bruce Cotton," in *Biog. Brit.* (London, 1797); D'Ewes, *Autobiography* (2 vols., London, 1845); Nichols, *Progresses of James I.* (4 vols., London, 1828); id., *Leicestershire* (London, 1795-1811); Gardiner, *History of England* (London, 1883-84).

COTTON-BIRD. A small South African titmouse (*Egithalus Capensis*), called *kapok vogel* (i.e. 'cotton-bird') by the Cape Colony Dutch on account of its wonderful nest, made of cottony materials, which closely resembles the nest of its congener, the penduline titmouse of Europe, illustrated on the Plate of PENSILE NESTS OF BIRDS. (See NIDIFICATION: TITMOUSE.) This nest, first figured by Le Vaillant (*Oiseau d'Afrique*, Paris, 1806), whose picture has been widely copied, is usually wrongly assigned to an entirely different bird.

COTTON FAMINE. The name given to an industrial crisis in the manufacturing towns of northern England, occasioned by the almost complete disappearance of cotton imports from the United States during the last three years of the Civil War. As a result of the blockade of the Southern ports by the Federal Government, the importation of cotton from the United States into Great Britain sank from more than 1,000,000,000 pounds in 1860 to 816,000,000 pounds in 1861, 13,000,000 pounds in 1862, and 6,000,000 pounds in 1863; and as the imports from the United States constituted more than three-fourths of the total supply, the blow to the cotton industry in Lancashire was a stunning one. The suffering fell most heavily on the mill operatives, who, as a body, were brought to the verge of starvation by the partial or complete suspension of production. In November, 1862, it was estimated that more than 350,000 persons in Lancashire were subsisting on parochial relief or private charity. It is a notable fact that, in spite of their great privations, the factory population of Lancashire was in thorough sympathy with the Northern cause, which they regarded as a crusade against slavery. (Consult Arnold, *History of the Cotton Famine* (London, 1865).

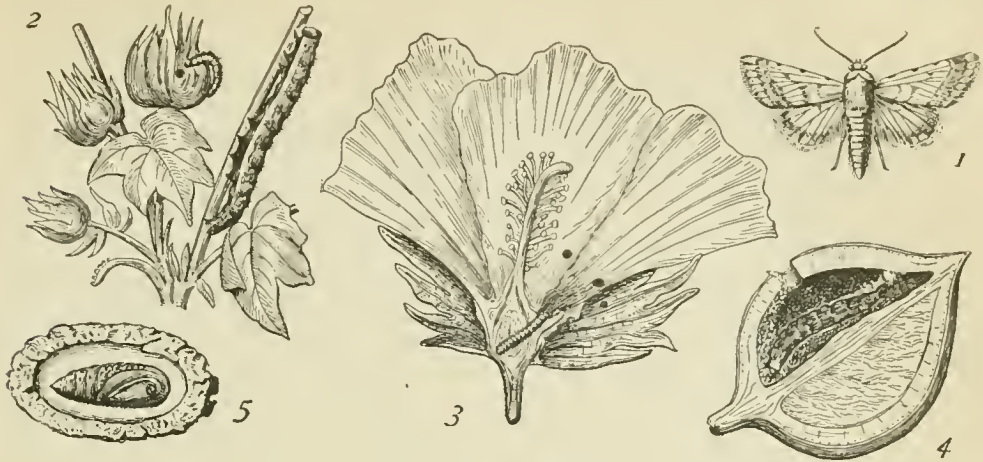
COTTON-GIN. A machine for separating the cotton fibre from the seed, invented by Eli Whitney of Massachusetts and patented March 14, 1794. Previously the work had been done by hand, a slow and tedious process, four pounds per day being the average of one man. See COTTON.

COTTON-GRASS (from its cottony spike), *Eriophorum*. A genus of plants of the natural order Cyperaceae, having the fruit accompanied with long, silky hairs which spring from the base of the ovary. The species are not very numerous; they are natives chiefly of the colder regions of the Northern Hemisphere. Several are found in America, and their white, cottony fruit-bearing spikes are well known in our swamps and bogs. The cottony substance is used for stuffing pillows, etc., and it is claimed that cloth may be made from it. The fibre lacks the twist of the cotton fibre and cannot be spun as readily. The stems of a Himalayan species, *Eriophorum cannabinum*, called *bhabhur*, yield a very strong fibre, and are much employed for making cordage, being simply twisted into cables, of which rope bridges are usually made; but they are not durable, and require much repairing every year. Cotton-grass is said to be valuable for sheep-pasture.

COTTON-INSECTS. The most important of the insects injurious to the American cotton-culture is the cotton-worm, the larva of a noctuid moth (*Alctia xyliana*), which sometimes defoliates whole districts. It is believed to be South American, and first became strikingly harmful in the Southern States in 1804. It is now known all over the Union, but its Northern food-plant is unknown. A Government commission reported in 1879 that the average loss to the cotton-growing States due to its ravages was then from \$15,000,000 to \$20,000,000 annually. The moth is 1½ inches in spread of wings, the fore wings and body reddish brown, with delicate zigzag markings, and the hinder wings pale gray-brown. It flies at night, and deposits eggs singly or sparsely on the under side of the leaves of the cotton-plant, where they hatch in mid-summer in about 50 to 60 hours. The caterpillars begin at once to devour the leaves, and so many are they, sometimes, that whole fields have been defoliated in three days, when the caterpillars swarm elsewhere in search of more food. In mid-summer the caterpillars remain about thirteen days, then fold a leaf about themselves and spin a cocoon in which they pupate. In two to four days after issuing from the chrysalis the female moth begins to lay—her average product being 400 eggs in the season. The natural food is the juice exuding from the glands on the leaf's midrib and at the base of blooms and bolls; but it will feed on any kind of fruit as it ripens. Until the worms are numerous enough to riddle the leaves badly, the moths continue to lay near their birthplace; then they migrate to considerable distances—seldom, however, until after the third generation of worms, say July 1, in southern Texas. Migrations are most common in the fall months, the moths flying at night and on cloudy days. In the Southern States only the moths hibernate (the worms never, nor anywhere), hibernation being more frequent in the Southwestern than in the Atlantic States. The moths hibernate under bark, in logs and timbers, etc., and mild winters are more severe on them than cold ones, which keep them torpid.

In some districts there are as many as seven generations in a season. The average time from the egg of one generation to that of the next is a month.

sap from the bolls by its puncture, causing them to become diminutive or abortive; but the principal injury it does is by voiding an excrementitious liquid which stains the cotton fibre yellow



THE COTTON-BOLL WORM.

1. Adult moth (*Heliothis armigera*). 2. Destructive larva (the 'boll-worm' or 'bud-worm'), with a small boll pierced by a young caterpillar. 3. Vertical section of a newly expanded cotton-flower, showing a young boll-worm at work. 4. Section of a large green boll, which contains a caterpillar that has devoured the contents of the cell. 5. A pupa within its earthen case.

The caterpillars visit earliest low alluvial lands where the plants are luxurious and thrifty. Moisture is favorable to their development, hot, dry weather unfavorable. The damages to the crop may reach 25 per cent. in the southern districts; but in the northern the worms may do more good than harm, by removing superabundant leaves, thus facilitating the ripening of the bolls.

For further and extensive information, and preventive measures, consult: Comstock, "Report on Cotton Insects," in *U. S. Dept. of Agriculture* (Washington, 1879), illustrated; Riley, *U. S. Entomological Commission, 4th Report* (Washington, 1885); *Bulletin No. 18, New Series* (Washington, 1898).

The bud-worm is scarcely second in its evil effects. (See BOLL-WORM.) It is hatched from eggs deposited singly on all parts of the plant, taking only three to five days to hatch in summer. The worm is much like the cotton-caterpillar, but larger. Its principal food is the flowers and bolls. The chrysalis is found a few inches underground. The chrysalis state lasts seven to ten days in midsummer, double that in cooler weather. The moth is in appearance and habits much like the Aletia, but seldom appears before July or August. Hibernation is in the chrysalis state only, and underground. Breeding continues until cold weather; but the first three generations of each year generally feed in the cornfields, the first lot seen on cotton being the fourth brood.

Other injurious moths infesting cotton and eating the foliage include the yellow bear (*Spilosoma Virginica*), the io (*Saturnia Io*), the basket-worm or bag-worm (q.v.), and several others. Cotton-culture in Egypt is afflicted by two very similar insects, viz., *Prodenia littoralis* and *Earias insulana*.

The cotton-stainer, or redbug (*Dysdercus suturellus*), is a small suctorial bug, "which drains the

or reddish, and very much depreciates its value in the market, the stains being indelible." It is also troublesome to orange-growers in cotton-growing districts. See *Insect Life*, vol. i. (Washington, 1888), illustrated. Several plant-bugs, such as the capsid (*Psallus delicatus*), known in Texas as the cotton-flea, and certain small beetles, are also injurious to cotton. For a description of the weevil, see WEEVIL.

The natural enemies of the cotton-worm and of the boll-worm are domestic fowls, birds, spiders, beetles, wasps, ants, parasites, etc. As preventive measures, the free use of poisons is good for both, and fall plowing, which upturns the chrysalids of the boll-worm, exposes these to the attacks of fowls and the fatal influences of cold.

COTTON-MOUSE. A field-mouse (*Peromyscus gossypinus*), dark brown, with grayish feet, prevalent in the southern United States, and injurious to cotton-plants. Its habits are similar to those of the common white-footed mouse of the North. See MOUSE.

COTTONMOUTH (so named from the white, cotton-like streak about its mouth). Properly, the moccasin-snake (q.v.), but also a name in the southern United States of the copperhead.

COTTONSEED AND ITS PRODUCTS. *Cottonseed-Oil.*—Cotton, which is described in the article bearing that title, when it is picked consists of the seeds, and the lint or fibre adhering to and covering the seeds. The seeds constitute rather more than two-thirds of this product, so that a crop of 9,000,000 bales of cotton would yield about 4,500,000 tons of cotton-seed. It constitutes a very valuable part of the product, and is used for manufacturing cottonseed-oil, for feeding animals, and for fertilizer. The cotton-seed, after the removal of the fibre, yields, upon pressure, a large amount of yellow oil, with a bland, nut-like taste. Even

before the invention of the cotton-gin in 1794, the utilization of cottonseed was attempted, and in 1770 samples of the oil were exhibited by the Moravians in Bethlehem, Pa. Previous to that time the seed had been allowed to rot on the ground by many of the planters, while others more intelligent had utilized it as food for cattle, sheep, and horses. Others dug furrow-trenches, and buried it in the rows on which the next crop of cotton would be planted. Some fed it raw to their stock, while others boiled it to make it possibly more palatable. In 1820 a patent was granted for a process for extracting the oil, but the construction of the mills was so slow that at the end of fifty years only twenty-six cottonseed-mills had been erected. In 1861 Mr. Edward Atkinson stated that if the cotton-plant produced no cotton it would still be well worth cultivating on account of the valuable products that can be extracted from the seed. This was fully realized toward the close of the nineteenth century, and the value of the cottonseed began to be more generally appreciated. Though much of it is still retained on the plantations as a fertilizing material, the amount manufactured in the United States was, in 1898, 5,594,602 tons, in 1899 4,450,000 tons, and in 1900 4,472,103 tons. The annual product is valued at \$33,000,000.

In addition to the oil extracted from the cottonseed, it yields the following by-products: *Linters*, or short bits of lint that adhere to the seed in the ordinary process of ginning, and are stripped by a specially constructed gin. These short fibres are used for the manufacture of batting and wadding. *Hulls*, the outer casings of the seed, which make a valuable cattle-food, whose properties are discussed below. *Oil cake*, the material left after the oil is expressed out of the nut. This is also used as a cattle-food or as a fertilizer. *Sludge*, which settles at the bottom of the oil-tanks, and is used in the making of soap, stearin, etc.

The process of manufacture is briefly as follows: The seed is shoveled from the ears into conveyors, which are spiral screens revolving in troughs with perforated bottoms through which any loose soil, sand, and stones are shaken. This process of cleaning is continued in a separator, where by means of different sized screens all dirt and impurities are removed. A strong magnet is also used to draw out bits of nails and other iron. The seed being sifted and cleansed, it is now passed through the linter, a specially constructed gin for removing these short fibres. The lint is ginned twice, the second process removing the shorter fibres, so that two brands or qualities are thus obtained. The next process is to crack the hulls in a machine between revolving blades and

oil: It may be expressed directly from the cold meats, this process making a high-grade oil; or the meats may first be heated in cookers. These cookers are steam-heated metal pans, covered with non-heat-conducting material and holding 700 pounds. The seeds are cooked from one-quarter to three-quarters of an hour, according to their condition as determined by the judgment of the operator, too little or too much cooking giving a smaller yield of oil. The cooked meats are dropped into a camel's-hair sheet, spread out on a steel plate. Wrapped in this sheet the meats are subjected to pressure, which is gradually increased till it reaches 3500 pounds per square inch. Under this pressure, a dark, murky oil flows out in streams and is received in reservoirs beneath the presses, whence it is pumped into settling-tanks. The cakes are now taken from their wrappings of camel's-hair, cooled, and dried. They are then cracked and ground into meal, which is shipped directly in sacks or pressed again into cakes. After the crude oil has settled it is drawn off and refined by treating it to a 10 or 15 per cent. solution of caustic soda and then allowed again to settle. As it settles the mucilaginous, albuminous, coloring matters and other impurities sink to the bottom, leaving a clear yellow oil, which may be still further filtered and purified if desired. The white oil of commerce is produced by shaking up the oil with a 2 or 3 per cent. mixture of fullers' earth and then allowing it to settle.

The commercial cottonseed-oils are classified as crude, summer yellow, summer white, winter yellow, and winter white. The winter oils are made by cooling the summer oils to the freezing-point, when the palmitin crystallizes and the oil is pressed out of the remaining solidified material. Cottonseed-oil consists chiefly of palmitin and olein, the winter oils being almost entirely olein. It stands midway between the drying and non-drying oils, its drying properties being inferior to those of linseed oil. (See OILS.) It solidifies at from 32° to 38° F., is almost odorless, and has a slight nutty taste. Its uses are constantly increasing. It is employed extensively in cooking and is also used as an adulterant of lard, olive oil, and other staples. By many it is preferred as a substitute for lard or butter, in cooking. It is used in pharmacy, in making soap and paint, as a lubricator and an illuminant. Consult Brooks, *Cotton* (New York, 1898).

Feeding and Fertilizing Value.—Brief mention has already been made of the use of cottonseed products for feeding cattle and for fertilizer. Whole cottonseed has been shown by a large number of analyses to range in composition as follows:

PERCENTAGE COMPOSITION OF WHOLE COTTONSEED

	Water	Ash	Protein	Fibre	Nitrogen-free extract	Fat
Maximum	17.51	8.00	29.70	32.40	36.70	29.34
Minimum	8.00	2.80	13.62	17.60	7.58	10.40
Average	9.92	4.74	19.38	22.37	23.94	19.45

bars, and then the meats and hulls are separated, the latter being sold either loose or in 100-pound bales. The meats are now ready to be passed through heavy calender rolls to crush the oil-cells. There are two processes of making cottonseed-

This material was used in the past to considerable extent as a feeding stuff for cattle and sheep, and was fed either raw, cooked or roasted, but, with the advent of oil-mills, its use for this purpose is much less in the vicinity of these,

because the seed is disposed of to better advantage to the millers or can be exchanged for cottonseed-meal. There are also the further reasons that the lint on the seed and the dust it collects are likely to be injurious, while at the same time it is not easy to mix the seed itself thoroughly with other coarse feeds. It is a very rich feeding stuff, and animals must be accustomed to it gradually. The whole seed is sometimes used for fertilizer, and then it is partially rolled.

Cottonseed-meal is the ground residue left in the manufacture of oil from the seed. It is sometimes called cottonseed cake and belongs to the class of feeding stuffs known as oil cakes. Cottonseed cake is of two kinds—undecorticated, or that from the whole seed, and decorticated, or made from the kernels after the hulls have been removed. Undecorticated cake was formerly largely used, but most of the mills now remove the hulls before expressing the oil. Cottonseed-meal is bright-yellow in color, with a sweet, nutty flavor. It deteriorates and becomes discolored with age. The following summary of over 400 analyses shows its range in composition, which is due to differences in the composition of the seed and the completeness with which the hulls are separated and the oil expressed:

PERCENTAGE COMPOSITION OF COTTONSEED-MEAL (DECORTICATED)

	Water	Ash	Protein	Fibre	Nitrogen-free extract	Fat
Maximum.....	18.52	10.60	52.88	15.15	38.68	20.66
Minimum.....	5.29	1.72	23.27	1.88	9.13	2.18
Average.....	8.52	7.02	43.26	5.44	22.31	13.45

This material is one of the richest feeding stuffs in use, considerably exceeding in protein and fat such materials as linseed-meal, but, in spite of this, it is quite well digested when fed in moderation. On an average, 88.8 per cent. of the protein, 57 per cent. of the fibre, 77.6 per cent. of the nitrogen-free extract, and 88.6 per cent. of the fat has been found to be digested by ruminants. It is fed extensively in the United States to cows, cattle, sheep, and nearly all kinds of farm stock, with the exception of pigs. The latter do not seem, for some reason, to be able to eat the meal, although they eat the whole seed without injurious effects. Young animals, like calves, have also often been injured by cottonseed-meal, and its use with them is attended with danger. All experience goes to show that the fresh meal can be fed to other kinds of animals without danger and in large quantities after they become accustomed to it. Six, eight, and even ten pounds of cottonseed-meal per head is often fed to steers, with good results, using no other kind of grain. It is undoubtedly best to mix some material like cornmeal with it. For cows about two pounds a day seems to be a safe limit for continued feeding, although three and often four pounds are often fed. It tends to give a firmer, harder butter, which will stand shipment better. Larger quantities can be fed with safety in winter than in summer. It is one of the cheapest of the highly nitrogenous feeding stuffs, and is therefore one of the most economical for balancing rations.

Cottonseed-hulls, which are removed at the mills by means of crushers, screens, and shakers, also possess some feeding value, and are much used with the meal. They constitute nearly one-

half of the weight of the ginned seed. They contain about 11 per cent. of water, 4 of protein, 46 of fibre, 33 of nitrogen-free extract, and 2 per cent. of fat. Their digestibility is low, less than 40 per cent. of the total dry matter being assimilated. They are hard and dry, usually covered with a fuzzy lint, and very bulky. For this reason they are put up in bales weighing about ninety pounds. They are used principally as a cheap substitute for hay, and for the purpose of giving bulk to the ration. Large numbers of cattle are fattened in the Southern States of the United States on cottonseed-meal and hulls exclusively, in proportions varying from two to six pounds of hulls to one pound of meal. The practice is claimed to be economical and profitable, and the diet apparently does not injure the health of the animals or impair the quality of the product.

Cottonseed-meal is rich in fertilizing materials, especially nitrogen, as shown by the following average of over 200 analyses: Water, 7.8; ash, 7; nitrogen, 6.8; phosphoric acid, 2.9; and potash, 1.8 per cent. It is chiefly used as a source of nitrogen, and finds quite extensive use for that purpose through the Southern portion of the United States. It has given excellent results with

sugar-cane, cotton, and corn, and has been successfully substituted for barnyard manure in the culture of tobacco. But its use as a fertilizer is of course wasteful, as the food constituents are not utilized in that case. A more rational practice in many cases is to feed the meal and apply the resulting manure to the soil, since from 80 to 90 per cent. of the fertilizing materials would be recovered in the manure, and additional benefit would be secured in the production of meat, milk, etc. Cottonseed-hulls are to some extent burned as fuel, and the resulting cotton-hull ashes are rich in potash and make an excellent fertilizer for tobacco. (See ASIENS.) Consult Roper, "Cottonseed Products," in *Twelfth United States Census*, vol. ix., part iii. (Washington, 1902).

COTTON STATE. Alabama. See STATES, POPULAR NAMES OF.

COTTONTAIL. Any of the smaller American hares, especially the common wood-hare or gray rabbit. The name refers to the fluffy white scut, and is often personified as 'Molly Cottontail.' See HARE, and Plate of HARES AND PIKA.

COTTON WHIGS. See CONSCIENCE WHIGS.

COTTONWOOD. A name applied to a number of species of *Populus* on account of the abundant white cottony hairs surrounding the seed. The trees are widely distributed. Some attain large size and are valuable for many purposes. See POPLAR.

COT'YLE'DON (Gk. *κοτύληδών*, *kotyledōn*, cup-shaped hollow socket, from *κοτύλη*, *kotylyē*, hollow cup). The first leaf or leaves of an embryo. In seed-plants the cotyledons are usually formed within the seed, and in most cases

they escape during germination, but are usually very different in appearance from the later leaves. See SEED.

COTYLOSAURIA (Neo-Lat. nom. pl., from Gk. *κοτύλη*, *kotylē*, hollow cup + *σαύρος*, *sauros*, lizard). The order which includes the most ancient reptiles, fossil in rocks of the Carboniferous Age, which, according to E. D. Cope, gave rise to the Theromorpha (q.v.), whence sprang the saurian and serpentine forms, and also to the lines leading to the fish-reptiles (Ichthyopterygia) and the turtles (Chelonia). The cotylosaurians are thus characterized by Cope: "Quadrat bone united with adjacent elements by suture; temporal regions with roof of a few symmetrical segments. No distinct post-orbital bars; vertebrae amphicelous; ilium narrow, vertical; feet ambulatory."—*Report United States National Museum, 1898* (Washington, 1900).

COTYS, or **COTYTTO** (Lat., from Gk. *Κότυς*, *Kotys*, *Κοτυττώ*, *Kotyttō*). A Thracian goddess, whose festival, the Cotyttia, was held at night and was notorious for its debaucheries. Her worship was adopted by some of the Greek States.

COUCAL, *kōō'kāl* (probably an African word, although according to Cuvier it was coined in 1796 by Le Vaillant in his *Oiseaux d'Afrique*, from Fr. *couc-ou*, cuckoo + *al-ouette*, sparrow). A kind of cuckoo, many species of which are widely distributed throughout Africa and south-eastern Asia to Australia, constituting the sub-family Centropodinae, especially characterized by having the hind toe terminated by a straight, spine-like claw, whence they have been called 'lark-heeled.' They are large, ground-keeping birds, generally red and black, more or less glossed, and sometimes banded with brown, and are known generally as 'ground-cuckoos.' A species of the Philippines has a rounded crest and black, horny appendages to the feathers of the head and throat. Some other Asiatic species mimic pheasants in appearance and gait and are called 'pheasant-cuckoos.' The best-known one is the very common Indian 'crow-pheasant' (*Centropus Sincensis*), is nearly two feet long, black, with the mantle and wings chestnut, and utters a curious howling cry, followed by a series of rattling exclamations. All these birds make their own nests, sometimes elaborate roofed structures in thorny bushes, and lay white eggs incrusted like those of an ani. They are closely allied to the American road-runner. See CUCKOO.

COUCH, DARIUS NASH (1822-97). An American soldier. He was born at South East, N. Y., graduated at West Point in 1846, served in the Mexican War (1846-47), and was brevetted first lieutenant in 1847 for 'gallant and meritorious conduct' at Buena Vista. In 1849-50 he served against the Seminoles, and in 1853 made an important exploring expedition into northern Mexico. In 1855 he resigned from the army to become a merchant in New York, but in June, 1861, reentered the service as a colonel of volunteers, and in August became brigadier-general. He served in 1861-62 with the Army of the Potomac, rendering valuable services at Fair Oaks, Williamsburg, and Malvern Hill; was promoted to be major-general in July, 1862; commanded the Second Army Corps at Fredericksburg and Chancellorsville; was in command of the Department

of Su-quehanna in 1863 and 1864; and was at the head of a division at the battle of Nashville. He resigned in 1865, and in the same year was an unsuccessful candidate on the Democratic ticket for the Governorship of Massachusetts. He was subsequently Collector of the Port of Boston in 1866-67, was quartermaster-general of Connecticut in 1877-78, and was adjutant-general of that State in 1883-84.

COUCHANT, *kou'chant* (Fr., pres. part. of *coucher*, to lie down). In heraldry, a beast lying down, with his head up, is couchant. If the head is down, he is dormant. See HERALDRY.

COUCH-GRASS (corrupted from *quitch-grass*, *quitch-grass*; so called from its rapid growth), *Agropyron repens*. Also called wheat-grass, dog-grass, quickens, and squich or quitch. A grass chiefly known as a troublesome weed. It is common in most parts of Europe and North America. See AGROPYRON.

COUCY, *kōō'sē'*, THE CHÂTELAIN DE. A French troubadour, whose name was Raoul or Renaud. He became Châtelain of Coucy in 1186, took part in the Third Crusade (1189-91), and was killed by the Saracens about 1203. His work consists of about sixteen songs, in the troubadour style, but with more sincerity and originality than the usual *chansons courtoises* of the time. They were published by Rath as *Die Lieder des Castellan von Coucy* (Heidelberg, 1883). The legend connected with his name is one of great age, and is found in the literature of many countries, though it is most likely of Breton origin. About the end of the thirteenth century there appeared a story or *roman* in verse by a certain Jakemon Sakesep, of whom nothing is known, and whose name is taken from an acrostic given in his work, *Roman d'aventure*. He tells of the loves of the Châtelain de Coucy and the Dame de Fayel. Falling ill on his way from the Holy Land, the Châtelain ordered that after his death his heart be taken to his lady. But the husband of the lady intercepted the messenger, took the sacred souvenir, and forced his wife to eat it. Thereupon the Dame for horror starved herself to death. The story was published with a modern version by Crapelet (Paris, 1829).

COUCY-LE-CHÂTEAU, *kōō'sē'le-shá'tō'*. A small village and cantonal seat (population, in 1901, 683) in the Department of Aisne, France, 10 miles north of Soissons. It is celebrated for the remains of its mediæval castle, standing on an acclivity, accessible on one side alone, and one of the most formidable fortresses of its period. The castle covers an area of 10,000 square yards, and is surrounded by lofty walls and a moat. Four towers flank the donjon, which is 210 feet high, 100 feet in diameter, and has walls 34 feet thick. It is public property and is classed among the historical monuments of France. Built by Enguerrand III., who died in 1242, it was purchased in 1396 by Louis of Orléans, and in 1498 became Crown property. It was dismantled by Mazarin's order in 1652.

COUDER, *kōō'dār'*. LOUIS CHARLES AUGUSTE (1789-1873). A French painter, born in London. He studied in Paris under David and Regnault and exhibited regularly at the Salon from 1817 until his death. Although he painted both religious and historical subjects, he is better known by his large historical compositions at

Versailles and in the Louvre, namely "The Siege of Yorktown" and "The Battle of Lawfield." He was a member of the *conseil supérieur* of the Ecole des Beaux-Arts and wrote some critical works on art.

COUDERT, kōō-dēr', FREDERIC RENÉ (1832-1903). An American lawyer, born of French parents in New York. He graduated at Columbia University in 1850, and was admitted to the New York bar three years later. In 1877 he was a delegate of the New York Chamber of Commerce to the Antwerp Congress, which was held for the purpose of establishing a universal system of general average. He was counsel for the United States before the International Bering Sea Commission (Paris, 1893-95); a member of President Cleveland's Venezuela Boundary Commission (1896-98); and president of numerous societies and clubs. He received the Cross of the Legion of Honor and also decorations from Italy and Venezuela.

COUDERSPORT, kou'dēr-z-pōrt. A borough and the county-seat of Potter County, Pa., 110 miles east by south of Erie; on the Allegheny River, and on the Coudersport and Port Allegheny Railroad (Map: Pennsylvania, C 2). It contains a public library. The borough has flour-mills, a foundry, a tannery, glass-factories, and manufactures of clothes-pins, baskets, furniture, barrels, hubs, etc. Population, in 1890, 1530; in 1900, 3217.

COUDREAU, kōō'drō', HENRI ANATOLE (1859—). A French explorer, born in the Department of Charente-Inférieure, and educated at Cluny. In 1881 he explored French Guiana and the adjacent territory, and in 1895 he was commissioned by the Government of Pará to explore the Tapajos, Xingu, and other branches of the Amazon. These explorations are described in several interesting volumes published in 1897. His other publications include: *Voyage au rio Branco et aux Montagnes de la Lune* (1886); *Etudes sur les Guyanes et l'Amazonie* (1887); *Chez nos Indiens* (1892); and three volumes on his voyages along the before-mentioned affluents of the Amazon (1897).

COUES, kouz, ELLIOTT (1842-99). An American naturalist, particularly distinguished for his researches in ornithology. He was born at Portsmouth, N. H., graduated at Columbian University in 1861, from the medical department of that institution in 1863, became an assistant surgeon in the United States Army, and made extensive studies of the flora and fauna in the vicinity of the various posts at which he chanced to be stationed. In 1873-76 he was attached as surgeon and naturalist to the United States Northern Boundary Commission, and from 1876 to 1880 as secretary and naturalist to the United States Geological and Geographical Survey of the Territories, directed by Dr. F. V. Hayden. He resigned his commission in 1880, and thenceforth was occupied wholly with scientific pursuits. From 1877 to 1887 he was professor of anatomy at the National Medical College at Washington, D. C. He was elected to the National Academy of Sciences in 1877, was a founder of the American Ornithologists' Union, and an editor of the *Auk*, the journal of that society. About 1880 he became interested in spiritualism, theosophy, and allied matters, and for a time was affiliated with the Theosophical Society. He was known as a

student of comparative anatomy and general biology, and for seven years was connected with the *Century Dictionary* as editor and contributor in the departments of general zoology, biology, and comparative anatomy. But while his field of activity was wide, he was prominent chiefly as a writer on ornithology, and in particular on that of North American birds. His *Key to North American Birds* (1872; rewritten 1884; again, 1901) has perhaps had a greater influence on American ornithology than any other work. With this should be named his *Field Ornithology* (1874); *Birds of the Northwest* (1874); *Birds of the Colorado Valley* (1878); an incomplete *Bibliography of Ornithology* (1878-80); *New England Bird-Life* (1881; with W. A. Stearns); and a *Dictionary and Check-List of North American Birds* (1882). He also made investigations regarding the early exploration of the trans-Mississippi region, and edited (1893) the *Journals* of Lewis and Clark. As a contributor to the technical advance of ornithology in America he ranked as not greatly inferior to Spencer Baird (q.v.), and as a popular expositor of the subject probably had no equal.

COUGAR, kōō'gēr (Fr. *couguar*, Sp. *cuguardo*, from native South American *cuguacuara*, *cuguacuarana*). One of the names of the American panther (*Felis concolor*), described in this work under PUMA (q.v.). Although widely in use, the name should be abandoned, because it perpetrates an error of identification. Cuvier explained its origin in his *Règne Animal* (Griffith's version, *The Animal Kingdom*, vol. ii., London, 1827), as follows, speaking of the puma: "It is called by the Mexicans *Mixtli*; in Peru, *Puma*; in Brazil, *Cuguacuarana* (the word *Cougoua* is contracted by Buffon from this latter barbarous appellation); and in Paraguay *Gua-zuara*. . . . The name *Cougoua*, by which it is most commonly known in Europe, particularly in France, appears, probably, to have been borrowed from that proper to another animal; . . . but puma is its native name." Elsewhere it appears that the 'other animal' was the *eyra* (q.v.). A drawing of this cat brought to Europe by John Maurice, Count of Nassau, when Governor of Dutch Guiana in the seventeenth century, was labeled *cugnacuarana* and *cugua-guarana*. This was copied by Maregrave and Piso and applied by Buffon, in the contracted form above noted, probably under the belief that the *eyra* (which is concolorous) was the same animal as the puma.

COUGHING (AS. *cohhetan*, Dutch *kugehen*, to cough, MHG. *küchen*, *kichen*, Ger. *keuchen*, *keichen*, to gasp; imitative of the sound). Considered physiologically, coughing consists, first, in a long inspiration which fills the lungs to a greater extent than usual; second, in a closure of the glottis, or narrow opening in the organ of voice (see LARYNX), at the commencement of the act of expiration; and third, in a sudden forcing open of the glottis by the violence of the expiratory movement. In this way, a blast of air is driven upward from the lungs through the mouth, which carries with it anything that may be present and cause irritation in the air-passages. Coughing may occur from irritation in the back of the throat, in the larynx, trachea, or bronchial tubes, and may be excited by irritant gases, or by articles of food or drink—such as

even a drop of water or a crumb of bread—making their way into the air-passages instead of into the œsophagus, or by excessive or morbid secretion from the walls of the air-tubes, or even by the entrance of cold air, when the lining membrane of the air-passages is abnormally irritable. Cough is reflex and involuntary generally, and is due to irritation of the terminal fibres of the pneumogastric nerves, which are distributed to the mucous membrane of the respiratory tract. The object of coughing in the animal organism is unquestionably to guard against the danger of the entrance of mechanical and chemical irritants into the air-passages; and accordingly the mucous membrane, especially of their upper part, is endowed with a most exquisite sensibility, which, when aroused by mechanical irritation or by disease, provokes incessant coughing until the cause of the irritation is removed. Cough is a common symptom of all diseases of the organs of respiration, as well as of inflammatory affections of the throat, tonsils, and nose. The treatment of cough depends upon the cause. See PNEUMONIA; BRONCHITIS; PLEURISY; TUBERCULOSIS.

COUIY. A tree-poreupine. See PORCUPINE.

COULANGES, kōō'lānzh', FUSTEL DE. See FUSTEL DE COULANGES.

COULANGES, PHILIPPE EMMANUEL, Marquis de (1631-1716). A French courtier, famous for his correspondence with his cousin, Mme. de Sévigné (q.v.). His writings include *Recueil des chansons* (1698); *Lettres* (published with those of Mme. de Sévigné); and *Mémoires*, edited by Monmerqué (Paris, 1820).

COULIN, kōō'lin. In Spenser's *Faerie Queene*, a British giant killed by falling into a chasm when pursued by Debon.

COULMIERS, kōō'miyá'. A village in the Department of Loiret, France, 13 miles northwest of Orleans (Map: France, H 4). Population, in 1901, 368. On November 9, 1870, the German and French forces, under Von der Tann and Aurelle de Paladines respectively, met here in a seven hours' battle, the former suffering a loss of 1308 and being compelled to retreat to Artenay, the French losing 1500.

COULOMB, kōō'lón' (named after the physicist Coulomb). The practical unit of quantity of electricity, being the amount produced each second by an electric current of the strength of one ampere; therefore, if in the ordinary form of silver voltameter, m grams of silver are deposited, $m \div 0.001118$ is the number of coulombs which have passed, assuming that an ampere deposits 0.001118 gram of silver per second. See AMPERE; ELECTRICAL UNITS.

COULOMB, CHARLES AUGUSTIN (1736-1806). A French physicist, celebrated for his researches particularly in electricity and magnetism. He was born at Angoulême in 1736, and in early life became an officer of engineers. In 1777 he gained a prize by an essay on the construction of magnetic needles (*Sur les aiguilles aimantées*). In 1779 his *Théorie des machines simples* gained the prize offered by the Academy; and in 1781 he was a third time successful in an essay on the friction and resistance of cordage, etc., used in machines. In the same year he was elected a member of the Academy, and his services were employed on all the most difficult problems in me-

chanics. He is known as the inventor of the torsion balance (q.v.), by which the attraction of electricity and magnetism can be measured, while his memory has been perpetuated by the use of his name for the unit of electric quantity. Having offended certain influential persons by reporting unfavorably on a project for a navigable canal in Bretagne, Coulomb was for some time imprisoned, but received from the States of Brittany a present of a handsome watch, as a reward of his firm opposition to an expensive and unprofitable scheme. He lived in retirement during the Revolution, but took part in the investigations attending the introduction of the metric system by the new Government.

COULOMMIERS, kōō'lō'myá'. The capital of an arrondissement and a garrison town in the Department of Seine-et-Marne, France, on the Grand-Morin, 38 miles east of Paris. Its parish Church of Saint Denis dates from the thirteenth century, and it has remains of a castle built in 1613. There is a monument to the heroic Beau-répaire, who killed himself in 1792 rather than surrender the town of Verdun. It has woolen mills, manufactures of starch and cheese, and market-gardening is largely carried on. Jean de Boullonge or Valentin, the artist, was a native of Coulommiers. Population, in 1901, 6505.

COULTER, kōl'tēr, JOHN MERLE (1851—). An American botanist and educator, born at Ningpo, China. He received his education at Hanover College, Indiana, and subsequently studied at Harvard. After serving for a year as botanist to the United States Geological Survey in the Rocky Mountains, he was made professor of natural science at Hanover College, where he remained for five years. In 1879 he was appointed professor of biology at Wabash College; from 1891 to 1893 was president of the Indiana State University, and from 1893 to 1896 presided over Lake Forest University. In 1896 he became head of the department of botany in the University of Chicago. Dr. Coulter's published works include the following: *Manual of Rocky Mountain Botany* (1885); *Handbook of Plant Dissection* (jointly with J. C. Arthur and C. R. Barnes, 1886); and *Manual of Texan Botany* (1892-93). He has also published a work on the morphology of gymnosperms, general works on plant relations and plant structures, and has edited the *Botanical Gazette*.

COUMARIN, kōō'mā-rin. * See CUMARIN.

COUMOUNDUROS, kōō-mōōn-dy'rōs, ALEXANDROS. See KUMUNDUROS.

COUNCIL (OF, *concile, concilic*, Lat. *concilium*, from *com-*, together + *calare*, Gk. *καλεῖν*, *kalcin*, to call, OHG. *holōn*, Ger. *holen*, AS. *goholian*, Engl. *hale*, to summon). An assembly of ecclesiastical dignitaries held for the purpose of regulating the doctrine or discipline of the Church. As early as the second century Church councils were convened in which only one or two provinces took part, the bishops and presbyters binding themselves to carry out the decisions arrived at in their own communities. These assemblies were commonly held in the chief town or metropolis of the province, and the bishops of such capitals—who, after the third century, bore the title of *metropolitan*—were wont to preside over the meetings, and to consider questions of doctrine and discipline which had arisen within the territory. Over these metropolitan councils

were established, at a later period, the provincial synods, exercising authority over several united provinces, and finally, the national councils. After the fourth century, when the Christian religion was established in the Roman Empire, we read of *ecumenical*, i.e. universal councils, so called because all the bishops of Christendom were invited or summoned by the Emperor. In some early synods we find bishops, presbyters, and others taking part in the deliberations; but after the opening of the fourth century only the bishops were convened. According to the doctrine of the Roman Catholic Church, the Pope alone, or, by way of exception, in some cases the college of cardinals, had the power of convening ecumenical councils, which, in the Catholic view, represent the universal Church under the guidance of the Holy Ghost. Questions were determined by the majority of votes, and the Pope or his proxy presided and confirmed the resolutions carried in the synod. In matters of faith, the Holy Scriptures and the traditions of the Church were the guide; while in lighter matters, human reason and expediency were consulted. In the former, ecumenical councils are held to be infallible, but in other matters of discipline, etc., the latest synod decides questions. The question of the Pope's subordination to the decrees of the ecumenical councils was long and warmly debated during the Middle Ages, but is not asserted by any Roman Catholic theologian to-day.

Twenty ecumenical councils are recognized by the Roman Catholic Church: (1) The first Council of Nicaea, held A.D. 325, in the height of the Arian controversy to define the doctrine of the Godhead of Christ, and to settle the proper time of keeping Easter against the Quartodecimans. (2) The first Council of Constantinople (381) completed the Nicene symbol by the definition of the Godhead of the Holy Ghost. (3) The Council of Ephesus (431) defined the unity of person in God the Son, against Nestorius, and guarded the definition by applying the term *θεοτόκος*, *theotokos*, to His mother. (4) The Council of Chalcedon (451), against the opposite heresy of Eutyches, asserted the twofold nature of Christ. (5) The second Council of Constantinople (553) condemned some survivals of Nestorianism. (6) The third Council of Constantinople (680-81) condemned the Monothelites. (7) The second Council of Nicaea (787) was directed against the iconoclasts and defined the respect to be paid to images. (8) The fourth Council of Constantinople (869-70) was called to secure the peace of the Eastern and Western churches, by the deposition of Photius, who had unjustly intruded into the see of Constantinople. The following councils, all held in the West, were subsequent to the schism between the Eastern and Western churches, and are consequently not recognized as ecumenical by Easterns or by Anglicans. Over the next seven councils, four held in Rome and three in southern France, the popes presided in person, without Imperial coöperation; they were held now, not so much to condemn heresy as to deal with other pressing needs of the Church, such as the encroachments of the Imperial power and reform in ecclesiastical discipline. (9) The first Lateran Council (1123) was called to settle the dispute between the spiritual and temporal powers on the question of investiture. (10) The second Lateran

Council (1139) condemned the errors of Arnold of Brescia and others. (11) The third Lateran Council (1179) condemned the Albigenses and Waldenses, and passed a number of reforming decrees. (12) The fourth Lateran Council (1215), the most important ecclesiastical gathering of the Middle Ages, formulated a more detailed confession of faith in opposition to the Albigenses and other innovators, and passed seventy reforming decrees. (13) The first Council of Lyons (1245) threatened the Emperor Frederick II. with excommunication and deposition, and called on Christendom to take up arms against the Mohammedans. (14) The second Council of Lyons (1274) strove for the reunion of the Greek and Latin churches, and regulated Papal elections. (15) The Council of Vienne (1311-12) suppressed the Knights Templars and condemned various sects of the time, such as the Fraticelli and Beghards. (16) The Council of Constance (1414-18) was called to restore the unity of the Church by the recognition of a legitimate pope, and condemned the doctrine of Wiclif and Huss. (17) The Council of Basel, convoked in 1431, and later removed to Ferrara and Florence, discussed ecclesiastical reformation, and made a determined attempt, in consultation with Greek deputies who came to Florence, to bring about a union with the East. (18) The fifth Lateran Council (1512-17) annulled the Pragmatic Sanction and confirmed the bull *Unam Sanctam*, besides occupying itself with ecclesiastical discipline. (19) The Council of Trent (1545-63, with some interruptions), called to meet the problems presented by the Reformation, was very rich in consequences both for the confirmation of doctrine and the establishment of discipline. (20) The Vatican Council (1870) decreed the infallibility of the Pope. For further details of important councils, see NICEA; BASEL; CONSTANCE; TRENT, etc.

Among Congregationalists and Baptists the term council is applied to an assembly of ministers and delegates from neighboring churches, called by a local church, as occasion arises, to act or assist in ordaining a minister, or give advice on matters referred to it, beyond which its power does not extend. They have also a national council, composed of delegates from all parts of the denomination, and meeting for conference concerning its work. The Pan-Presbyterian Alliance, as the association of the reformed churches holding the Presbyterian system is called, holds a council every four years for conference on matters of general interest to the allied churches. So the Evangelical Alliance, a loose, undenominational body, holds councils, and the Methodists throughout the world held one in 1901.

The great history of the councils of all kinds from the Apostolic age to the Council of Trent is by C. J. Hefele, assisted in the latter part by A. Knöller and Cardinal Hergenröther (9 vols., Freiburg, 1855-90); there is an English translation by Clark and Oxenham of the first two volumes, and up to the eighteenth book of the original (4 vols., Edinburgh, 1871 et seq.). Consult also the great collection of canons and other acts of the councils, by G. D. Mansi (31 vols., Florence and Venice, 1759-98). A study of the first seven ecumenical councils from a doctrinal standpoint is presented by W. P. du Bose (New York, 1897), and their *Canons and Dogmatic*

Decrees, annotated with much additional matter, all in English, by H. R. Percival (New York, 1900). See **SYNOB**.

COUNCIL, PRIVY. See **PRIVY COUNCIL**.

COUNCIL BLUFFS. A city and the county-seat of Pottawattamie County, Iowa, five miles east of Omaha, Neb.; near the Missouri River, and on the Union Pacific, the Chicago and Northwestern, the Chicago, Burlington and Quincy, the Chicago, Rock Island and Pacific, the Illinois Central, and other railroads (Map: Iowa, B 3). The city is well laid out, and lies to a great extent on a plain underlying high bluffs. It has a public library, one of the first established in the State, and beautiful parks, notably Fairmont and Bayliss, and is the seat of the Iowa School for the Deaf. Railroad and wagon bridges over the Missouri afford communication with Omaha. Good transportation facilities have made Council Bluffs a commercial point of great importance; it has an extensive trade in agricultural implements, live stock, fruit, and produce, and manufactures of machinery, engines, lumber, paper, carriages, agricultural implements, and many other articles. The city government is conducted under a general State incorporation law, revised in 1897. The Mayor holds office for two years, and the city council is composed of representatives from the six wards of the city and two members at large. The council elects the city clerk, street supervisor, city physician, pound-keeper, chief of fire department, and electrician; the marshal and police are nominated by the executive and confirmed by the council; all other offices are filled by popular election. In 1804, on the site of Council Bluffs, Lewis and Clark held a council with the Indians—hence the name. Here, in 1846, the Mormons established a settlement, called Kaneshville, which, however, they soon abandoned for Salt Lake City. The city was chartered in 1850. Population, in 1890, 21,474; in 1900, 25,802.

COUNCIL GROVE. A city and the county-seat of Morris County, Kan., 24 miles northwest of Emporia; on the Neosho River, and on the Missouri Pacific and the Missouri, Kansas and Texas railroads (Map: Kansas, F 3). It is surrounded by a fertile agricultural and stock-raising country. The city contains a public library, and has municipal water-works and electric-light plant. Council Grove, settled in 1847, is one of the oldest towns in the State. Population, in 1890, 2211; in 1900, 2265.

COUNCIL OF ANCIENTS. See **DIRECTORY**.

COUNCIL OF BLOOD. See **ALVA**.

COUNCIL OF FIVE HUNDRED. See **DIRECTORY**.

COUNCIL OF TEN (*Consiglio di dieci*). The supreme body in the Venetian Government from the beginning of the fourteenth century till the overthrow of the Republic in 1797. The creation of the Council of Ten was but the final step in the process by which the oligarchic party succeeded in obtaining sole control of the Government, beginning with the so-called "Closing of the Grand Council" in 1297. Its immediate cause was a popular uprising in 1310 headed by the noble families of Tiepolo and Que-

rini. After the suppression of the revolt the Council of Ten was constituted as a secret body for the purpose of discovering and punishing all the participants in the conspiracy. Created at first for a few days, its existence was prolonged from time to time until, in 1335, it was made permanent. In spite of its name, the Council consisted of seventeen members, ten Counselors of the Black Robe, elected for a year, six Counselors of the Red Robe, chosen for eight months, and the Doge. In times of great emergency the Council was augmented by a *giunte* of twenty or more of the noblest citizens, so that until 1595 it was officially known as the *Consiglio di dieci e giunta*. The powers exercised by the Council were unlimited and touched upon every affair of public and private life. Its decisions, from which there was no appeal, were arrived at in secret, and its sentences were often carried out in the same manner. In spite, however, of its arbitrary acts and the relentlessness with which it visited punishment upon those who offended it, the Council of Ten was popular with the large mass of citizens in that it insured internal tranquillity and the equitable administration of justice and preserved the State against the ambition of powerful nobles. In 1539 the discovery of treasonable behavior on the part of certain of the Ten led to the creation of the *Inquisitori di stato*, to whom the Council delegated its police functions, reserving to itself the trial of offenders brought before it by the inquisitors. Legend has pictured the Council of Ten as a horrid tribunal, whose history is one of stealth and secret murder, but as a matter of fact its influence in Venice, though absolute for five centuries, was far from malignant.

COUNCIL OF THE INDIES, THE. A governing council formed in 1511 by King Ferdinand for the regulation of Spanish colonial affairs. It had unlimited powers, and covered every branch of administration.

COUNCIL OF WAR. A conference of officers in war time, whom the commander voluntarily calls together to discuss matters of moment. It is an unwritten but generally understood rule that the commandant of a garrison will accept, or at least solicit, the opinion of a council of war before surrendering to an enemy.

COUNSEL (OF, *consil*, *cunsel*, *consel*, from Lat. *consilium*, consultation, from *consulere*, to consult). A term applied to attorneys and counselors who become associated together in the conduct of a cause at any stage of the proceedings, or who jointly act as legal advisers in any matter, whether litigated or not. It is less frequently used in speaking of a single lawyer acting in any of the above capacities. The term 'of counsel' is employed to designate a lawyer who assists the attorney of record in the management, trial, and conduct of a case. See **ADVOCATE**; **ATTORNEY**; **LAWYER**.

COUNSELOR. In law, a person admitted to practice law in any capacity, and who is by reason of that fact an officer of the court. The term was formerly used to distinguish those lawyers who were licensed to appear in court, corresponding to the barrister in England and the advocate in Scotland. The distinction has been abolished in most of the United States, and it is

now used synonymously with attorney. See ATTORNEY; LAWYER.

COUNT (OF. *conte*, *comte*, Fr. *comte*, from Lat. *comes*, companions, from *com-*, together + *ire*, Gk. *lévai*, *ienai*, Skt. *i*, to go). In classical writers down to the end of the fourth century, the meanings attached to the word *comes* were comparatively few and simple. At first the word signified merely an attendant, and differed from *socius* chiefly in expressing a less intimate and equal relation to the persons accompanied. A little later, in Horace's time, it was applied to those young men of family whom it had become customary to send out as pupils under the eye of a governor of a province, or the commander of an army. Very soon the fashion of having attendants at home was introduced. The Emperor had many *comites* in this sense, and to these, as he gradually became the centre of power, he transferred the various offices of his household and of the State. The example of the emperors of the West was followed by the emperors of the East. Most of the titles at present applied to court officials are translations of the names applied to similar offices in the Byzantine Empire. The *comes sacrarum largitionum* was grand almoner and practically chancellor of the exchequer; the *comes curie* was the grand master of ceremonies; the *comes equorum*, the grand equerry. The *comes marcharum*, or count of the marches, was the original of the later marquis.

In France, the count of the palace (*comes palatii*) was the highest dignitary in the State after the mayor of the palace, and in the eleventh century had already acquired a rank apart from that of the other counts. He presided in the court of the sovereign in his absence, and possessed sovereign jurisdiction. The habit of instituting counts palatine was adopted by Spain and England. The counts of Chartres, Champagne, Blois, and Toulouse arrogated to themselves the authority to appoint palatine counts, and the ancient houses of Chartres and of Blois continued to claim in perpetuity the title of count palatine as that of their eldest sons. Counts of this sovereign class owed their origin to the feebleness of the later Carolingian kings, under whom they contrived gradually to convert the provinces and towns which they had governed as royal officers into principalities hereditary in their families. It was then that the counts came to be known by the names of their counties. The title was never used in England, though its Latin equivalent has always been the common translation for 'earl,' and the wife of an earl from a very early period has been styled 'countess.' For the history of the office in Germany, where it was of great importance, see GRAF. Consult: Rambaud, *L'empire grec au Xe siècle* (Paris, 1870); Luchaire, *Histoire des institutions monarchiques de la France sous les premiers Capétiens* (Paris, 1883); Maury, "La noblesse et les titres nobiliaires en France," *Revue des Deux Mondes* (December, 1882); Pfaff, *Geschichte des Pfalzgrafentums* (Halle, 1847).

COUNTER-CHANGED. A term in heraldry (q.v.). When several metals and colors are intermixed, one being set against another, they are said to be counter-changed.

COUNTERCLAIM. In pleading, an affirmative cause of action asserted by the defendant against the plaintiff and introduced in connection with his answer or defense proper. The counterclaim is a modern statutory device for enabling a person who is sued on a claim against him to procure an adjudication, at the same time, of a legal claim which he has against the party suing him. Its purpose is to consolidate the causes of action which two parties may have against one another, reducing the amount and cost of litigation and compelling the adjudication, so far as possible, of all open controversies between them. No such practice existed at common law, but every claim, no matter how closely related to another and opposing claim, constituted a separate cause of action and had to be separately prosecuted. As early as the year 1729, however, an act of the British Parliament introduced the principle of the set-off (q.v.), whereby, in case of mutual indebtedness growing out of the same transaction, the defendant was enabled to set his claim off against that of the plaintiff and have it allowed on the judgment. It was not until the Judicature Acts in 1875, however, that the defendant acquired the right of setting up a cross-claim, constituting a distinct cause of action.

Both the set-off and the counterclaim exist in the United States, the former generally, but the latter only in the so-called 'code States,' which have adopted the reformed procedure. These differ among themselves, however, as to the nature of the actions which can be pleaded by way of counterclaim, some following the modern English practice, under which any cause of action, however divergent from that alleged in the complaint, may be set up, and others, like New York, limiting the right of counterclaim to a matter arising out of the same transaction as that on which the action is based, or, in an action on contract, any other cause of action on contract. (New York Code of Civil Procedure, § 501.) See PLEA; PLEADING; RECOUPMENT; and consult the authorities referred to under PLEADING.

COUNTERFEITING (from *counterfeit*, from OF., Fr. *contrefait*, counterfeit, from ML. *contrafacere*, to imitate, from Lat. *contra*, against + *facere*, to make). The criminal offense of falsely and fraudulently making an article in the semblance of another with the intent to induce the acceptance and use of such spurious article for the genuine one. It is used most frequently of imitations of coined money, but is applied also to spurious trade-marks, or dies. The most important British statute on this topic is the Coinage Offense Act, 1861 (24 and 25 Vict. c. 99). In this country the subject is dealt with in the Revised Statutes of the United States (§ 5413 et seq.), especially so far as it relates to Federal coinage and securities and the money or securities of foreign nations; and other forms of counterfeiting are made punishable by State legislation. See COINAGE; FORGERY.

COUNTER-IRRITANTS. Medical agents applied to the skin so as to reddens (rubefacients), to vesicate (blisters or vesicants), or to produce pustules, purulent issues, or even sloughs of skin and of the subcutaneous textures (pustulants). Counter-irritants act by reflex influence upon central nerve-centres which con-

trol the blood-supply to diseased internal organs or deep-seated structures. The milder counter-irritants are mustard, turpentine applied on hot cloths, and tincture of capsicum. The stronger are blisters of cantharides or of ammonia; croton oil or tartar emetic in ointment; and the actual cautery or hot iron. Setons, moxa, and caustics are no longer employed. None of the stronger counter-irritants should be used without medical advice, great mischief being done by their improper use. Counter-irritants relieve internal pain, and tend to promote the absorption of effusions. They should be applied at a distance from the site of the inflammation. Counter-irritants are much used for strains and diseases of the joints in horses, but should never be applied, as they too often are, in recent cases, or while the part is hot or inflamed. Cantharidine preparations and ointment of mercuric binoxide (red iodide of mercury) are the most convenient. For cows, use hot fomentations, followed by the smart friction of mustard paste; for dogs, soap liniment, strengthened, if required, by ammonia or turpentine. See MOXA.

COUNTERMINE. See MINES AND MINING, MILITARY.

COUNTER-PASSANT (Fr. *contre-passant*, passing opposite, from *contre*, Lat. *contra*, against + *passer*, ML. *passare*, to pace, from Lat. *passus*, step, from *pandere*, to stretch). In heraldry, a term denoting two beasts passing each other.

COUNTERPOINT. In music, the setting of one or more parts against a given melody, so that all the voices are of equal importance and independence. The name was first used in the fourteenth century. It suggested itself from the fact that one note (*punctus*) was set against another, *punctus contra punctum*. A counterpoint may be written in various ways against a given melody, as one, two, four, or even more notes against one of the cantus. The counterpoint most useful in practical composition is one where the different parts are variously constructed, as in the following (Handel):

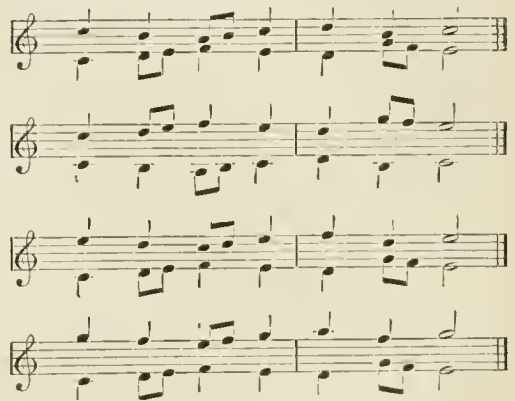


When two voices are used the counterpoint is called two-part; when three, three-part, etc. When the counterpoint lies uniformly above or below the cantus it is single. If the parts be constructed in regard to one another so that they can be changed or transposed over or under each other, without alteration in the movement,

or injury to the harmony, it is then called double counterpoint, for example:



The intervals most frequently used for transposition in double counterpoint are the octave, decima, and duodecima. The following admits of different transpositions:



When three voices are constructed so that they can be exchanged one against the other, the counterpoint is triple; when four, quadruple. The first indications of counterpoint we find in the thirteenth century in the works of Adam de la Hale. The development of the art of contrapuntal writing was then very rapid, and in the school of the Netherlands (in the fifteenth and sixteenth centuries) the acme of technical skill was reached. But counterpoint was then less a genuine musical art than an exhibition of astounding technical tricks. The great Italian schools (see PALESTRINA) returned to a simpler and artistic style. As a genuine art counterpoint culminated in the form of the fugue (q.v.). The latest and best treatises on counterpoint are those of Dehn, Richter, and Jadassohn.

COUNTERPOISE CARRIAGE. See ORD-NANCE.

COUNTER-POTENT. A fur used in her-aldry (q.v.).

COUNTER-PROOF. An impression which is obtained from a freshly printed proof of an engraving, by laying it, before the ink is dry, upon plain paper, and passing it through the press. By this means the ink is transferred from the wet proof to the plain paper, and a reversed impression is obtained, which is often

of use in enabling the engraver to judge of the success of his work. See ENGRAVING.

COUNTER-REFORMATION. The term used to describe those measures which the Roman Catholic Church took, after the Reformation was fairly started. (1) to reform abuses, (2) to counteract the Protestant movement in those lands where it threatened to succeed, and (3) to uproot it where it had entirely or very considerably succeeded. Long before the Protestant revolt took place there had been a demand upon the part of faithful sons of the Church for a reform in 'head and members,' from the Pope down to the humblest Christian. Several councils had been called to accomplish it, but did little. At last the Council of Trent was assembled, which, lasting with interruptions from 1545 to 1563, solemnly reaffirmed and defined Catholic doctrine, and enacted disciplinary measures to rectify widespread and prevalent abuses. Of the agents most active in raising the tone of the Church, animating its pulpit and its schools, and inspiring self-sacrifice and ardent piety, the chief have been the Jesuits—so much so, indeed, that the counter-reformation is frequently spoken of as their work. The other measures spoken of have naturally incurred more censure. The check or extirpation of Protestantism has been accompanied necessarily with violence, and thus contravenes modern notions of religious freedom—though it must be said that the intolerance of the Roman Catholic ruler or prelate was matched, when opportunity served, by that of Protestants in similar positions. In Bavaria the nobility which had favored Protestantism were expelled in 1564. At Treves the Elector, James of Eltz, in 1572, forbade Protestants his Court. In other ecclesiastical States of the Empire, as Bamberg and Salzburg, the rulers drove out the evangelical clergy and gave the laity the alternative of conformity to the Catholic Church or exile. Austria attempted to uproot religious liberty in Hungary, but was forced to restore it. In Bohemia Protestantism was extirpated during the Thirty Years' War. As far as the German Empire was concerned, the arbitrary exercise of power to repress Protestantism ended with the Peace of Westphalia in 1648. In such countries as Spain and Italy Protestantism never had more than a feeble existence, and so was rather easily suppressed by the Inquisition. In France there was never more than a possibility of Protestantism gaining an ascendancy, but in the sixteenth and seventeenth centuries it had many influential adherents. Civil wars, the result of political intrigue, and the acceptance from personal ambition of Romanism by Henry IV., ruined whatever prospects the Protestants had; and with the revocation of the Edict of Nantes in 1685, all semblance of State favor to Protestantism was removed and the faith outlawed. In the Netherlands persecution and war wrested the southern provinces from Protestant domination, but it remained in the northern. Scandinavia was not seriously shaken in her acceptance of Protestantism. In England, after tireless, ingenious, and heroic attempts of seminary priests, upon whose head a price was fixed, to effect a return to Catholicism, with the secret coöperation of many nobles and other prominent men, the scheme had to be abandoned, mainly because the audacious invasion of England by the

Spanish Armada in 1588 welded the nation into a whole against foreign political or religious dominion.

Consult: Ranke, *History of the Popes*, English trans. (London, 1867); A. Ward, *History of the Counter-Reformation* (New York, 1889); A. R. Pennington, *History of the Counter-Reformation* (London, 1900).

COUNTERSCARP. The side of the ditch of a fortification opposite to the parapet. The slopes of the scarp and counterscarp will depend on the nature of the soil, and the action on it of frost and rain. The scarp or extreme slope of the parapet is less steep than the counterscarp, because it has to sustain the weight of the parapet. See FORTIFICATION.

COUNTERSIGN. A watchword used by military bodies as a precaution against an enemy or enemies. The countersign may be changed at any moment, or any number of times, but is usually altered each twenty-four hours. It is given primarily to commanders of guards, and outposts and their sentries, to reconnoitring and visiting patrols, and to the field and regimental officers of the day. All others desiring to pass through the lines must first be supplied with the countersign, which is thus a guard against spies, strangers, and surprise.

COUNTER-TENOR. The highest adult male voice; most commonly the male alto (q.v.).

COUNTER-VAIR. A fur used in heraldry (q.v.).

COUNTESS'S POWDER. See CINCHONA.

COUNTIES CORPORATE. In England, cities and towns possessing the privilege of being governed by their own sheriff and magistrates independently of the county in which they are situated.

COUNTING-OUT RHYMES. See NURSERY RHYMES.

COUNT JULIAN. A gloomy but impressive tragedy by Walter Savage Landor (1812). The scene is laid in the time of Roderick, the last of the Goths, about 711.

COUNT ROBERT OF PARIS. A late novel of Sir Walter Scott (1833), the scene of which is laid at Constantinople in the eleventh century. The title character was a renowned French Crusader. The novel, written after Scott's financial troubles, betrays the author's failing powers.

COUNTRY LASSES, OF THE CUSTOM OF THE MANOR. The title of a play by Charles Johnson (1715), based on Fletcher and Massinger's *Custom of the Country* and Middleton's *A Mad World, My Masters*.

COUNTRY PARTY, THE. The anti-Royalist party in England in Charles II.'s time, which opposed the Court party. It finally developed into the 'Whig' Party.

COUNTRY WIFE, THE. A comedy by Wycherley (1673), drawn largely from Molière's *L'École des maris* and *L'École des femmes*. It is called by Macaulay "one of the most profligate and heartless of human compositions."

COUNTY (OF. *counte*, *contec*, Fr. *comté*, It. *contado*, from Lat. *comitatus*, county, escort, from *comes*, count, companion). Either (a) one of the civil divisions of a country, for judi-

cial and political purposes; or (b) a local subdivision of a State created by the sovereign power of its own will, regardless of the solicitation or consent of the inhabitants of said subdivision; or (c) a "local organization which, for the purpose of civil administration, is invested with the functions of a corporate existence." The Saxon term was 'shire,' a name still preserved in England. In the United States counties are divided into a number of townships or towns. Cities and incorporated towns and villages are, generally speaking, subdivisions of counties and townships, but in some instances a city may be geographically coterminous with a county, as is the case with Chicago and Philadelphia, while 'the city of New York' includes within its municipal limits four distinct counties. In Louisiana the similar division is called a 'parish.' For purposes of local government, each county has at least one court and one prison, and usually an almshouse. The smaller divisions are townships, from three or four to a dozen or more in a county. The commissioners or supervisors of these towns, chosen by popular suffrage, form an administrative board to conduct the financial and other county affairs. In all the United States there are more than 6800 counties. Usually each county chooses one or more members to the Lower House of the State Legislature. Counties are the creatures of the legislative will. They are vested with certain corporate powers in order to enable them to perform the duties required of them as part of the machinery of the State; and, inasmuch as all their powers are derived from the Legislature, the latter may enlarge, modify, or diminish them at any time. Counties are generally invested with the following corporate powers: To sue and be sued by a corporate name; to have a county-seat, a courthouse, and prison; to acquire and hold title to real estate; to levy taxes and to make such contracts as may be necessary for their corporate existence. For an historical sketch of the English county, consult Pollock and Maitland, *History of English Law* (2d ed., Boston, 1899). See SHIRE; also MUNICIPAL LAW, and consult the authorities there referred to.

COUNTY COUNCILS. Until 1888 the county government of England was conducted in the quarter sessions, held by justices of the peace. As these magistrates were appointed by the Crown to attend to all administration and the minor judicial business of the county, there was practically no local self-government. To remedy this, the first Local Government Act was passed in 1888 by a Conservative Ministry. It established representative county councils elected every three years by all ratepayers, male and female, of the shire, besides other non-resident property-holders, under certain conditions. Practically the same qualifications are necessary for membership in the council, except that women are not eligible. The elected councilors choose additional members called aldermen, one-third of the council in number, and also a mayor, who may or may not be of their number. The council controls all the administrative functions of the county, such as the management of the roads, insane asylums, county jails, and the issue of liquor licenses; it shares the police control with the justices of the peace.

Mr. Henry Fowler's second Local Government Act, passed by the Liberals in 1894, perfected

the first by transforming the ancient vestries of a population of 300 and over into parish councils, for the management of local business. Smaller parishes, if they so desire, may, with the consent of the county council, have the same privilege. The system closely resembles the American township organization. Scotch and Irish counties have since been organized along similar lines, except that there are no coöpted aldermen in the former country.

Previous to 1885 all London lying without the ancient city had no local government except the church vestries. It was brought under the operation of the Act of 1888 and given a county government. In 1899 the administrative functions of the vestries not ecclesiastical were turned over by the county council to subordinate boroughs, having mayors, aldermen, and councilors of their own. The old city, though represented in the county council, retains most of its antiquated constitution. The personnel of the London County Council is very high, and the amount of work it has accomplished is remarkable. It has successfully provided public baths and libraries, parks and playgrounds, better dwellings for the poor, besides giving £500,000 for technical education. Consult: *The Local Government Act*, Statutes 56 and 57 Viet., c. 73; also Macmorran and Dill, *The Local Government Act of 1894*, with a good introduction (London, 1896); Courtenay, *The Working Constitution of the United Kingdom* (New York, 1901), 238-40, 246-50.

COUNTY COURT. In English and American law, a judicial tribunal of considerable dignity and importance, whose jurisdiction is co-extensive with the limits of a county (q.v.). The county courts are among the most ancient institutions in England, dating back to the popular tribunals of the Anglo-Saxon period. We find provisions regulating their procedure as far back as the laws of Edward the Elder (901-25) and of Canute (1014-35). Under the system of local self-government which was characteristic of that period, the county courts (*shire gemots*) were the chief ordinary tribunals of the English people, their judicial authority being superseded by that of the *Witenagemot*, or Great Council of the Kingdom, only for particular purposes and on rare occasions.

It will be remembered that in England the county, or shire, is not merely a political subdivision of the State for administrative purposes, as it is in most cases in the United States, and as are the departments into which the territory of France is divided; but it is a separate and distinct political division, in many cases antedating, in organization and in its functions, the State itself. As the supreme judicial tribunal, therefore, of such an ancient political organization, the county court was not only the fountain of justice for the people of England, high and low, but a court of great dignity and authority as well. It was presided over by the sheriff (*shire reeve*), who was the high judicial officer of the county, and, like the court baron and other popular tribunals, was composed of the freeholders of the county who should be summoned by the sheriff for that purpose. Its original jurisdiction extended to all civil and criminal matters, and it was the common court of appeal from all the minor courts of the county. Under the Saxon régime there was no regular

tribunal of appeal from the judgments of the county court, but after the Conquest the superior authority of the new national tribunal, the *Curia Regis*, or King's Court, drew to it appeals from the county courts. The rapid growth in power and importance of the King's courts, especially of the so-called common-law courts—the King's Bench and Common Pleas—tended to reduce the authority of the more ancient tribunals, and their jurisdiction was impaired by successive acts of Parliament. They still exist, however, with a limited but still considerable authority, which has been expressly defined by recent statutes. See County Courts Act, 1888 (51 and 52 Viet. c. 43).

For the modern organization of county courts in England and the United States, see the article COURT. See also CURIA REGIS; SHERIFF. Consult *Encyclopedia of the Laws of England* (London, 1897), title "County Courts" (vol. iii., 527); also the authorities referred to under COURT, and Raikes, *Admiralty Jurisdiction and Practice in County Courts* (London, 1896).

COUP, *koo* (Fr., stroke). A word often used in a figurative sense. *Coup d'état*, 'stroke of State,' means an arbitrary encroachment suddenly effected by the governing authorities upon the constitution of the State, altering or setting aside the prerogatives of other parts of the body politic. The coup d'état which is usually understood by this term is that effected by Louis Napoleon when he dispersed the legislative body, imprisoned the Republican leaders, and made himself practically dictator (December 2, 1851). *Coup de main*, a 'stroke of the hand,' is applied, in the language of war, to a sudden and successful attack. *Coup de foudre*, a thunderbolt; applied figuratively to any astonishing occurrence. *Coup d'œil*, 'a stroke (or glance) of the eye,' is applied in speaking of persons who have the faculty of comprehending all the relations of a complicated matter at one survey; or, in art, it expresses the general effect of a picture or group at first sight. *Coup de théâtre* means properly a trick of the stage to produce a shock by surprise, and is hence applied to any analogous dramatic effect.

COUPÉ, *koo'pá'* (Fr., literally, section, cut, from *couper*, to cut). A four-wheeled, one-horse, closed carriage, holding two persons, with separate seat for the driver. (See CARRIAGE.) The name is also given to a compartment of a railway carriage in Continental Europe.

COUPED, *koopt* (Hybrid Engl., p.p. of Fr. *couper*, to cut). In heraldry, a term used to describe the head or any limb of an animal cut off smoothly from the trunk. It is distinguished from *crased*—i.e. forcibly torn off, and therefore ragged and uneven. A distinction is also made between *couped* and *couped close*, the latter signifying that the head or limb is cut off close, leaving no part of the neck or trunk attached to it. When crosses, bars, bends, and the like are cut so as not to touch the sides of the escutcheon, they are also said to be couped.

COUPERIN, *koo'p-rän'*, FRANÇOIS (1668-1733). A French organist of high repute. He was probably the greatest of a family of great musicians which began with his grandfather, ARMAND LOUIS (1600-65), and continued through several generations of his own descendants. He

was born in Paris, and comparatively early in life earned for himself the title of le Grand. He is historically important chiefly because he was one of the first great composers for the harpsichord known to musical history. He is considered to have influenced materially the work of Scarlatti, Handel, and Bach, and is by many musical historians regarded as the actual pioneer of modern music. He died in Paris, having attained great popularity as a composer, and high distinction as the clavirist of the King's chamber and organist of the Chapel Royal. He left several important compositions and writings, among them four *Livres de pièces de clavecin* (Paris, 1713, 1716, 1722, and 1730 respectively).

COUPERUS, *koo-pá'rüs*, LOUIS (1863—). A Dutch author, born at The Hague. He attracted attention by his collection of poems, *Een Lent van Vaerzen* (A Springtide of Verse) (1884), followed by a second entitled *Orchidcen* (Orchids) (1887). Subsequently he turned to fiction, his best work in which is *Majesteit* (Majesty) (1893; a German translation by Raché, 1895). He is ranked among the most important of recent Dutch writers.

COUPLE (OF. *euple*, *coplc*. Fr. *couple*, Sp. *cópula*, from Lat. *copula*, bond, from *co-*, together + *apere*, Gk. *ἅπτειν*, *haptéin*, to join). A couple is the name given in statics to a pair of equal parallel forces acting in opposite directions and at different points of a body. It is shown in the article MECHANICS (q.v.) that when two parallel forces act in opposite directions on a body, they may be replaced by one equal to their difference, acting parallel to them and in the same plane with them, the point of application of this resultant being *beyond* the points where they are applied. This point recedes farther from the points of application of the original forces the nearer they approach equality, getting to an infinite distance when they become equal, and when their resultant accordingly is zero. In this limiting case, the forces constitute a couple. They have no tendency to *translate* the body; their action goes wholly to make it rotate about an axis passing through its centre of inertia, and perpendicular to the plane in which the couple acts. Such being the case, a couple cannot be replaced or counteracted by any single force, for such a force would produce translation; it can only be replaced or balanced by other couples. The length of the straight line which meets the lines of action of the forces at right angles is called the 'arm' of the couple, and the product of the arm and either force is called the 'strength' or the 'moment' of the couple. It is evident that a couple can be replaced by one of equal strength. For a complete discussion of the composition and resolutions of couples, reference should be made to some treatise on statics, such as Routh, *Treatise on Analytical Statics* (Cambridge, Eng., 1892); or Minchin, *Statics* (New York, 1892). See MECHANICS.

COUPLET (Fr., dim. of *couple*, pair, from Lat. *copula*, bond). Any two lines which rhyme together. The term is, however, more frequently used by critics to denote two lines which contain the complete expression of an idea, and are, therefore, to a certain extent independent of what goes before or what follows. The poetic wits of the age of Queen Anne excelled in this

kind of aphoristic versification. Pope, it has been said, reasons in couplets. For example:

"Tis with our judgments as our watches, none
Go just alike, yet each believes his own."

COUPON, κῶπῶν (Fr. *coupon*, from *couper*, to cut, from *coup*, It. *colpo*, Lat. *colpa*, from Gk. κόλαφος, *kolaphos*, blow with the fist, from κολάπτειν, *koláptein*, to strike). An undertaking on the part of an obligor on a money bond or other interest or dividend bearing obligation to pay a definite amount of accrued interest or dividends to the holder thereof at a specified date. It is usually so attached to the bond, debenture, or other principal instrument that it can conveniently be cut off (whence the name) and presented for payment. Each interest or dividend coupon constitutes in law a separate claim or demand, and may be separately enforced. Corporate bonds and similar securities are usually issued in this form, and so, sometimes, are shares of preferred stock, in which case the coupons represent the guaranteed dividend payments. Of course the coupon does not, in any of these forms, confer any additional legal rights on the holder of the security against the person bound thereby nor increase the liability of the latter. A general agreement to pay interest or dividends at such a rate would be equally valid and efficacious. The advantage of the coupon lies in the convenience to the holder of furnishing him with a separate undertaking for each interest or dividend payment for presentment and collection, and in the fact that corporate coupons are usually of a negotiable or quasi-negotiable character, facilitating their transfer from hand to hand. See **NEGOTIABLE INSTRUMENT**.

COURAJOD, κῶρᾶ'zhó', LOUIS (1841-96). A French archaeologist and art critic, born in Paris. For many years he was in charge of monuments of the Middle Ages and Renaissance in the Museum of the Louvre. He is the author of valuable books on the history of art in France and Italy, particularly that of the Renaissance and Middle Ages. His most important work is *Alexandre Lenoir, son journal et le musée des monuments français* (1878-87), but also noteworthy are *Livre-journal de Lazare Durand* (1873) and *L'école royale des élèves protégés* (1874).

COURANT, κῶρ-riint' (Fr., pres. part. of *courir*, to run). In heraldry, a term used for running.

COURAYER, κῶρ-rá'yá', PIERRE FRANÇOIS LE (1681-1776). A French theologian. He is chiefly known for the part which he took in the discussion, which so interested Leibnitz and others at the time, on the possibility of the reunion of Christendom, and especially of uniting the Church of England with the Roman Catholic communion at the Reformation. In 1723 he published anonymously a *Dissertation sur la validité des ordinations anglaises* (English trans. London, 1725; new ed. Oxford, 1844), in which he endeavored to prove that there had been no break in the line of ordination from the Apostles to the English clergy. This was naturally received with enthusiasm in England, and Oxford conferred the degree of D.D. on him; but it subjected him to so much criticism and unpopularity in France that he presently fled to England, where he remained until his death. In 1736 he published a French translation of Sarpi's *History of*

the Council of Trent, and in 1767 a translation of Sleidan's *History of the Reformation*.

COURBET, κῶρ'rá', AMÉDÉE ANATOLE PROSPER (1827-85). A French admiral, born at Abbeville. He was educated at the Ecole Polytechnique and graduated with honors. In 1880 he was made rear-admiral and three years afterwards commanded the French fleet in the campaign of Tongking. After the violation of the Treaty of Tientsin by the Chinese, Courbet, in a naval engagement (1884), destroyed the entire Chinese fleet without losing a vessel of his own. At the end of the war, in 1885, he started to return to France, but his strength had given out under the stress of the campaign and he died at sea.

COURBET, GUSTAVE (1819-77). A French landscape, figure, and portrait painter, founder of the modern Realist School. He was born at Ornans (Franche-Comté) on June 10, 1819, of wealthy peasant parents. His first instruction in art was acquired at his home under Flageonlet, a pupil of David. In his twentieth year he went to Paris, where he worked in different studios, but he was in the main self-taught. He speedily found recognition, and soon became the chief leader of the Realists, in opposition to both Classicists and Romanticists. Courbet was of a very independent character, and had so little regard for the opinions of the judges of the Salon that he returned for six successive years a picture rejected in 1841. When in the Exposition of 1855 his pictures were unfavorably hung, he withdrew them altogether and held a separate exposition. In 1870 he returned the Cross of the Legion of Honor to Napoleon with a protest. He was Radical and Socialist in politics, and under the Commune he was made director of the fine arts. As such he saved the collections of Thiers and of the Luxembourg from the infuriated populace, but he sacrificed the Vendôme Column in order to appease the crowd. For this act he was imprisoned after the downfall of the Commune, and all of his paintings were sold at public auction. In order to avoid further suits for damages, he went into voluntary exile, and died broken-hearted near Vevey, in Switzerland, December 31, 1877. He was a strong but rather coarse character, blustering, but good-natured—a healthy animal without the least spirituality.

His paintings portray nature exactly as it is, without the least addition of sentiment or idealism, for he conceived realism to be possible only through the absolute negation of idealism. As he confined himself to the reproduction of nature, there could be no refined composition or real action in his work, for these depend on the painter himself. His figures were no more than models in the positions painted, his landscapes mere patches of forest or country taken at random. In figure painting he was partial to the coarse types preferred by the Flemish School, and he always painted them life size. His coloring was excellent, and in his figure subjects, which are chiefly brush works, it was pure, strong, and mellow. In his landscapes he used the palette-knife very freely, obtaining brilliant and sparkling effects of color. His chief defect is his lack of strength in drawing.

The volume of Courbet's work was enormous, and his activity extends over a variety of sub-

jects. Among the best of his portraits and figure painting are the "Man with a Leather Belt," the "Fair Dutchwoman," the "Stone-Breakers," representing two workmen breaking stones, as one can see them in the street: the "Demoiselles de la Seine," two typical grisettes reclining in ungraceful attitudes on the grass, yet a picture of great beauty of color. The most ambitious of all is his "Burial at Ornans" (painted 1850, now in the Louvre), a village funeral. This picture is composed of thirty-nine life-size figures, admirably balanced. On the one hand are the perfunctory mourners, such as the priest, beadles, pall-bearers, grave-diggers; on the other, the real mourners. Among his best landscapes are the "Combat of the Stags" and the "Deer Retreat." His marine painting, "The Wave," has been acquired by the Luxembourg.

Consult: Muther, *History of Modern Painting*, vol. ii. (London, 1896); Isham, "Gustave Courbet," in Van Dyke's *Modern French Masters* (New York, 1896); Silvestre, *Les artistes français* (Paris, 1878); Patoux, "Courbet," in *Les artistes célèbres*; D'Iderville, *Gustave Courbet* (Paris, 1878); and *La Vérité sur Courbet* (Paris, 1879).

COURBEVOIE, kōōr'b'vwā' (Fr., crooked way). A town in the Department of Seine, France, on the left bank of the Seine, five miles northwest of Paris (Map: France, B 6). Courbevoie has well-built houses and large barracks erected by Louis XV. Its principal manufactures are white lead and brandy. Population, in 1896, 20,105; in 1901, 23,765; commune, 25,330.

COURCEL, kōōr'sēl', Baron ALPHONSE CHOMON DE (1835—). A French diplomatist. He was educated in France and Germany, and entered political and diplomatic life in 1859. For several years he was Ambassador to Germany. He was appointed French arbitrator on the Bering Sea Arbitration Commission in 1892, and was elected president of that body by his associates. He became Senator in 1892, and was made Ambassador to Great Britain in 1897, but resigned in 1898. He is considered an authority on international law.

COURCELLE, kōōr'sēl', DANIEL DE RÉMY, Sieur de. French Governor of Canada from 1665 to 1672. He succeeded Mézy and preceded Frontenac. In 1666, in the depth of winter, he led a force of 300 men by way of Lakes Champlain and George to the country of the Mohawks, who had persisted in attacks upon the colony. He returned having accomplished nothing, and having lost a large number of his troops through the severity of the weather. Not long after, with Tracy, the lieutenant-general, and an army of 1300, he undertook a second expedition, which resulted in the complete destruction of the five Mohawk forts. The English were considerably alarmed at this invasion of territory claimed for the British Crown, and there ensued a correspondence between Tracy and Governor Nicolls of New York. Courcelle projected the post at Kingston (Katarakoui), afterwards established by Frontenac.

COURCELLE-SENEUIL, kōōr'sēl' se-nē'y', JEAN GUSTAVE (1813-92). A French political economist, born at Seneuil (Dordogne). He occupied the chair of political economy at the University of Santiago de Chile from 1853 to 1863, and became a member of the Paris Academy

of Moral and Political Science in 1882. Among his principal publications are the following: *Traité théorique et pratique des opérations de banque* (6th ed., 1876); *Manuel des affaires* (4th ed., 1883); *Traité d'économie politique* (3d ed., 1890); and *Liberté et socialisme* (1868), in which, as in several others of his writings, he defends the principle of individualism.

COUREURS DE BOIS, kōō'rēr' de bwā (Fr., wood-runners). Canadian bush-rangers of the seventeenth century who forsook their families and homes, and took to the woods to engage in the beaver trade. The movement became so general that whole communities were virtually deprived of their male support, and much destitution ensued. Stringent measures to restrain the movement were taken by the French King, but without much result. The rangers, declared outlaws, built palisade forts at Detroit, on Lake Superior, and at various points in the West and Northwest.

COURIER, kōō'rī-ēr (OF., Fr. *courrier*, runner, from *courir*, Lat. *currere*, to run). A bearer of dispatches or letters, usually sent on public business. Such messengers were extensively used up to comparatively recent years—indeed, until the establishment of the postal and telegraph systems superseded them. Organized courier service existed among the Medes, Assyrians, and Egyptians from very early times, and relays of runners were employed by the ancient Greeks until the system of mounted couriers was introduced by the Persians. Among the Romans the change from runners to mounted men took place in the time of Augustus. During the Middle Ages, besides the staff of couriers in the service of sovereigns, the English and French nobility employed professional runners, called in France *laquais*, and in England running footmen. They wore an elaborate costume and carried a long cane topped with a large, hollow silver apple which contained provision for the journey. Toward the middle of the fifteenth century, formal permission was given to the Government couriers of Germany and Spain to carry unofficial letters.

In modern times correspondence between diplomatic representatives and their home Government is sometimes conducted by means of special couriers, who are considered inviolable messengers unless they happen to fall into the hands of a hostile power in time of war. The office of King's Messenger in the English diplomatic service used to be an honorable and coveted position, but is now practically obsolete. The word courier also signifies a hired attendant who accompanies travelers abroad, and whose special duty consists in making arrangements for the journey, attending to passports, settling hotel bills, and the like. An important qualification is the ability to speak several foreign languages.

COURIER DE MÉRÉ, kōō'ryā' de mē'rā', PAUL LOUIS (1772-1825). A French liberal politician and classical scholar. He was born in Paris, January 4, 1772, entered the army in 1792, and served without distinction until 1809, pursuing his studies as he found opportunity, and publishing unimportant critical articles and translations. He from his youth cherished a bitter aversion to the nobility and a passionate love of Greek literature. On resigning from the army

he went to Florence and discovered there a complete MS. of the Greek pastoral *Daphnis and Chloë* (see LOXET'S), which he edited (1810) and translated into exquisite French. At the Restoration (1815) he became active as a political pamphleteer, writing letters for *Le Censeur*, comparable to *Les provinciales* of Pascal or the satires of Junius. Fined and imprisoned for his *Simple Discours* (1821) ridiculing a plan to endow the royal family, he published a report of his trial that had a sensational success throughout France. His last political satire, *Le pamphlet des pamphlets* (1824), is among the bitterest and best; witty, classical in form and scholarly allusion, epigrammatic in its common sense. A few months after, he was assassinated (April 10, 1825), by whom, the Government could or would never discover. Courier's *Œuvres complètes* were published in four volumes, with an essay on his life by Armand Carrel (Paris, 1830).

COURLAN, kōōr'lāu (Fr., probably from native South American). The French book name for a limpkin (*Aramidae*), called also 'crying bird' and 'mad-widow' (*vidua loca*) by Spanish Americans. See LIMPkin.

COURLAND, kōōr'lānd, or **KURLAND** (translation of Lett. *Kurscunne*, from *Kur*, Finnish tribe inhabiting the region in mediæval times + *scunne*, land, OCh. Slav. *zemlya*, OPruss. *samc*, land, Gk. *χάματ*, *chamai*, on the ground, Lat. *hemo*, *homo*, man). One of the Baltic provinces of Russia, bounded by the Gulf of Riga and the Province of Livonia on the north, Vitebsk on the east, Kovno on the south, and the Baltic Sea on the west (Map: Russia, B 3). Area, 10,535 square miles. The surface is level, broken only by isolated hills, while the coasts are very low. There are a number of lakes, and a large portion of the area is covered with forests. The climate is moderate, the annual temperature averaging 43° F. The chief occupations are agriculture, cattle-raising, and fishing. There are also a number of breweries, distilleries, and textile mills, but the manufacturing industries are very little developed. The commerce, on the other hand, is quite extensive. The seaport of Libau is the commercial centre. Courland had a population in 1897 of 672,634, over 70 per cent. of which were Letts, representing the agricultural laboring class; over 8 per cent. were Germans, mostly large landholders; and the rest consisted of Jews and Russians. The Protestant Church counts over 70 per cent. of the population among its adherents. The capital is Mitau.

Courland came under the rule of the Teutonic Order in the thirteenth century. In the second half of the sixteenth century it became an hereditary duchy under the sovereignty of Poland. After a long internal struggle between the Russian and the Polish parties the duchy came under Russian influence with the appointment of Biron as Duke of Courland in 1737. It was formally annexed to Russia in 1795.

COURSE. See MASONRY and BUILDING.

COURSE OF TIME, THE. A religious epic in blank verse by Robert Pollok (1827).

COURSER (Fr., *courseur*, from OF., Fr. *course*, Lat. *cursus*, course, from *currere*, to run). The French name of eight or ten species of plovers of various genera inhabiting desert regions of Africa and Asia. The best-known is

the cream-colored courser (*Cursorius gallicus*), common on arid plains from the western Sahara to northern India. All are sand-colored above, swift-footed, and wary, and conceal themselves by simply squatting and remaining motionless and so practically invisible; their food consists of insects, mainly locusts. The name black-backed courser is frequently given to the crocodile-bird (q.v.).

COURSING (from *course*, OF., Fr. *course*). The pursuit of a hare by greyhounds, who follow it by sight and not by scent, is one of the most ancient of field sports. Arrian (A.D. 150) made its history the subject of much research. There are two kinds of coursing—'open,' which may be described as the haphazard pursuit of any hare that can be discovered, without regard to any set rules or regulations; and 'close' coursing, in which the course is determined by fixed boundaries, or otherwise fenced in. In the latter case, the hares, which have been previously secured, are released, and after sufficient law (time or distance) has been allowed them, the dogs are slipped, and the pursuit begins. Both these kinds of coursing are practiced under similar rules in Great Britain and America alike. The oldest coursing club in England was that established at Swaffham in Norfolk in 1776, and of existing organizations, the most important is the Altear Club, established in 1825. In America the sport has been in existence since the middle of the nineteenth century, but open meetings, in which competitors from regular organizations take part, are of comparatively recent date. The supervising and controlling body of the sport is 'The American Coursing Board,' and the principal meets, or meetings, are in the two Dakotas, Kansas, Nebraska, Iowa, and Minnesota.

In England the sport is conducted under the laws and rules of the National Coursing Club, and the principal meet is that held every February over the Altear Course near Liverpool, for the Waterloo Cup, a prize instituted in 1836. It was originally an 8-dog course, increased the next year to 16, the year after to 32, at which it stood until 1857, when it became a 64-dog stake, and as such it still remains. The best dogs of the world compete, and the title 'Waterloo Cup' has become synonymous with the highest prize of the year in coursing, in many countries. Russia, America, South Australia, New South Wales, and New Zealand all have their Waterloo Coursing Cups. In competitions the judge follows the dogs throughout the course, noting every movement from the moment they are slipped until the 'kill,' or conclusion of the course—his decision being based on the following general rules: I. For *speed*, according to the degree of superiority shown, 1, 2, or 3. II. For the *go-by*—the starting of a greyhound a clear length behind its opponent, passing it in a straight run and obtaining a clear length ahead—2 points, or if gained on the outer circle, 3 points. III. The *turn*—a sharp turn of not less than a right angle in the hare's course when pressed by a dog, 1 point. IV. The *wrench*—a change of less than a right angle in a hare's course when pressed, one-half point. V. The *kill*, 2 points, or in a descending scale in proportion to the merit displayed, which may be of no value. VI. The *trip*—an unsuccessful effort which threw the hare off its legs, or the getting so close as to snatch it and lose hold.

COURT (Fr. *cour*, It. *corte*, from Lat. *cohors*, inclosure, from *co-* together + **hors*, connected with Lat. *hortus*, garden, Gk. *χῆρος*, *chortos*, hay, OIr. *gort*, sedge, Goth. *gards*, court, OllG. *garto*, Ger. *Garten*, AS. *gard*, Engl. *yard*). Courts, in the legal sense—i.e. authorities empowered to try and punish persons charged with offenses against the public or State, and to settle disputes regarding the rights and duties of individuals—have existed among all peoples that have emerged from savagery. There is no single root from which early judicial authority springs; nor is there, even among the Aryan peoples, any single typical form of primitive court. The right of the community to punish offenses against the community—a right which expresses itself originally in lynch law—may beget a popular jurisdiction in criminal cases; and the interest of the community in preventing feuds may make the popular assembly competent to decide civil cases. The belief that flagrant breaches of the social order are offenses against the gods may vest criminal jurisdiction in the priests; and the duty of the priests to see that vows and promises under oath are performed may be expanded into a fairly broad civil jurisdiction. The attribution to the king of disciplinary powers over the popular army, and the concentration in his hands of the power of preserving internal peace, may create an extensive royal jurisdiction over crimes and also over torts; and the king's civil jurisdiction may be widened by ascribing to him a patriarchal authority analogous to that exercised by the heads of houses and of clans. Private disputes may be referred, voluntarily at first, to the decision of king or priest or assembly, and when such references have become customary the duty of decision may be transformed into judicial authority. Traces of all these ideas and influences are discernible in the early judicial systems of the Aryan peoples.

Sir Henry Maine has called attention to the great importance given to courts and their machinery in every ancient code. It is due, he thinks, to the fact that the authority of a court of justice overshadowed all other ideas and considerations in the minds of those early code-makers. The dominant notion in their minds, when they undertook to classify legal rules, was not a law, or a right, or a sanction, as they are now considered by an analytical jurist, but a court of justice. "The great fact is that there now exists an alternative to private reprisals, a mode of stanching personal or hereditary blood-feuds other than slaughter or plunder. Hence, in front of everything they place the description of a court, of its mechanism, of its procedure, of its tests of alleged facts." This conscious reverence for courts of justice, and this sense of their paramount importance, have diminished, Sir Henry Maine believes, as civilization has advanced and peace has become more prevalent. Some doubt of the correctness of this opinion may be entertained. In the first place, the fact that the term 'court,' which, as we have seen, originally designated a body exercising legislative as well as judicial powers, has been limited in most countries to the designation of a tribunal exercising judicial powers only, indicates that such powers are deemed of prime importance. In the second place, the authority of courts, especially in federal governments un-

der written constitutions, and, throughout Christendom, under international arbitration treaties, is very great, and destined to be still greater.

GREEK COURTS. Among the Greeks of the Homeric age, jurisdiction both in criminal and in civil cases appears to have been vested in the kings and chieftains. In important cases their judgments were submitted to the people for confirmation, but no real participation in the finding of judgments was accorded to the people until the Greek States became democratic. Then the magistrates, whose powers at first were similar to those previously exercised by the kings, became mere chairmen of popular courts. At Athens, in the fourth century B.C., every adult citizen was normally a 'dikast' or juror, and civil and criminal cases were decided by majority vote in courts containing from two hundred to five thousand or more jurors.

ROMAN COURTS. Among the Romans criminal jurisdiction was exercised by the king or by officials appointed by the king. From the decisions of such officials appeal to the popular assembly was sometimes granted. In the Republican period such an appeal (*provocatio*) lay against all sentences condemning a citizen to death, or scourging, or exile, and also against fines beyond a certain amount; and this appeal became the real trial. The forms observed were substantially the same as in legislation. A proposal to condemn the accused to a certain punishment was submitted to the people, debated before them in informal assembly (*contio*), and accepted or rejected by them in formal assembly (*comitia*). (See **COMITIA**.) During the last century of the Republic, criminal courts of a different type, the *questiones*, gradually absorbed the jurisdiction previously exercised by the assembly. The *questio* was a body of select jurors sitting under the presidency of a special magistrate, usually a praetor. The jurors were drawn from a small panel, which included only the most distinguished and wealthy citizens.

Civil jurisdiction, also, is said to have been exercised by the Roman kings. It is probable, however, that the king did not decide the controversies submitted to him; but, like the praetor in later times, heard the pleadings only, and then sent the parties to a *judex*, or referee, nominated (or at least accepted) by the parties themselves. It also seems probable that, in the royal period, the referees were usually priests (*pontifices*). In the Republican period there were elected boards of *judices* (*decemviri, centumviri*), to which cases were sent by the praetor; but reference to a single *judex*, regularly a senator, seems to have been customary in actions on tort or on contract, and was admissible, during the last century of the Republic, in all cases.

The fundamental principle which controlled the administration of civil and criminal justice, and the composition of the courts, in the Republican period was the separation of jurisdiction (*ius*) and judgment (*judicium*). Pleas were made and the case was formulated before a magistrate, but the decision was rendered by a private citizen or by a body of private citizens. In the Imperial period this system (*ordo judiciorum*) was gradually supplanted by the *cognitio extraordinaria*, in which an Imperial official conducted the trial and rendered the decision. Under this system the administration of

justice was taken out of the hands of the people and became a part of the general administration created and controlled by the emperor. As in the general administration, so in the administration of justice, there were courts of lower and higher instance, and appeals could be taken. In the late Empire (fourth and fifth centuries) the municipal courts had jurisdiction only in police cases and in petty civil cases. The ordinary court of first instance was that of the rector or president of the province. From his decision appeal ran to the vicar of the diocese, and then to the praetorian prefect, the immediate personal representative of the emperor. The appellate courts had not merely cassational, but reformatory jurisdiction—i.e. they could not only set aside a decision, but they could also reverse or modify it.

TEUTONIC AND MEDIEVAL COURTS. The primitive Teutonic court was a folk-moot, or popular court, in which the decision was proposed by the presiding dignitary (king or prince or hundredman), or by a law-speaker appointed by the presiding dignitary, and was approved or disapproved by the assembled freemen. In the later Frankish (Carolingian) Empire, special judgment-finders (*scabini*, *Schöffen*, *échevins*) gradually took the place of the body of freemen. These judges or assessors were at first appointed by the count; but, after the dissolution of the Empire, their office, like most offices, became hereditary.

The early Teutonic courts were those of the hundred, of the county, and of the tribe. In the Frankish Empire the court of the tribe was replaced by the royal court, held by the count palatine; and in the Carolingian period circuit courts were held by Imperial *missi*. Even in the Carolingian period the courts of the hundred and of the county were being supplanted by manorial courts, held by the bailiffs of the seigneurs, and after the dissolution of the Empire the popular free courts disappeared in many parts of Europe. During the Middle Ages appeared special feudal courts and independent city courts. Nearly all the mediæval courts were courts at once of first and last instance; there was no system of appeals; the king's court was usually nothing but a feudal court for the great vassals. In all of these courts, from the king's court down to the manorial court, the decision was usually rendered (or at least approved) by a limited number of judges or assessors, who were regularly the *pares* of the defendant—i.e. persons of the same class and rank. Throughout the Middle Ages there were also special ecclesiastical courts (see **CANON LAW**), with jurisdiction not only over Church matters, but over the persons of the clergy and over many matters to-day regarded as civil. In these courts the judicial organization and procedure of the late Roman Empire were perpetuated. From the ordinary (bishop's) courts appeals ran to Rome, and the Pope could appoint legates to hold special courts.

MODERN EUROPEAN COURTS. When the administration of justice was reorganized by the absolute monarchy, the new royal courts were modeled on the ecclesiastical courts. Professional or 'learned' judges replaced the mediæval lay judges; the judge or bench of judges rendered decision both upon the law and the facts; appeals ran from the courts of lower instance to

those of higher, and finally to the king's court. The modern European courts are still, essentially, courts of this Roman-Imperial-ecclesiastical type, except that the court of last instance has usually cassational jurisdiction only, not reformatory jurisdiction. The only important modification which has been introduced is jury trial in criminal cases. Lay assessors have been retained or reintroduced, in some countries, in the police courts and in the commercial courts. These latter courts, with special jurisdiction over merchants and commercial cases, are survivals of the independent city courts of the Middle Ages. The number of judges in a European court is usually proportional to the amount of business with which the court has to deal. In the larger courts the judicial force is divided into sections (sometimes termed *senates*), and the judicial business is distributed according to its character, criminal cases going to one section, commercial cases to another, etc. When a doubtful question of general importance comes before such a section, a session of the entire court may be called. In all the leading European States the independence of the judge is safeguarded by life tenure and fixed salary, and in the German Empire by the rule that a transfer, even when it is technically a promotion, cannot be made without the consent of the judge concerned.

ENGLISH AND AMERICAN COURTS. Originally of wider signification, the term court has come to represent a permanent organization or tribunal for the public administration of justice, composed of one or more judges, who, when engaged in the transaction of business, are attended ordinarily by attorneys and counselors, who represent the litigants; by clerks, who keep records of what is done; and by marshals, sheriffs, constables, or like officers, who enforce judicial mandates and preserve order.

In primitive communities, courts perform legislative and executive as well as judicial functions. The *scyresgemot*, county court, or sheriff's turn of Anglo-Saxon England was not simply a judicial tribunal presided over by a bishop and sheriff, but was an assemblage of freemen for the discussion and transaction of local affairs generally. The *Aula Regis*, or Great Council of the Kingdom, in the early English history performed legislative as well as judicial duties; and so did the stated assemblages of the ruling class in some of the English colonies in this country. In Massachusetts the present names of the legislative and the judicial bodies—the General Court and the Supreme Judicial Court respectively—bear testimony to the fact that the primitive court of the colony performed both legislative and judicial functions.

I. English courts may be classified in various ways. One basis of classification is their relative authority; and this divides them into superior and inferior courts. (a) The latter class includes those tribunals over which courts of the former class may exercise a supervisory jurisdiction by writs of *mandamus* (q.v.), *certiorari* (q.v.), or prohibition. They are of four kinds:

(1) Local courts of criminal or quasi-criminal jurisdiction, such as *borough sessions*, held by a recorder or the justices of a municipal borough; *licensing sessions*, held by borough justices for granting or withdrawing liquor licenses;

petty sessions and *special sessions*, or courts held by two justices or a borough police magistrate in the exercise of a summary jurisdiction over minor offenses; *general* or *quarter sessions* of the borough and of the county, for the trial of felonies and misdemeanors within the borough or county jurisdiction, and for appeals from petty and special sessions.

(2) *Local civil courts of record*, such as borough civil courts and county courts. The latter are lineal descendants of the *scyresgemots* of King Alfred; but their present constitution, jurisdiction, and practice are regulated by the County Courts Act, 1888 (51 and 52 Vict. c. 43). Under this statute, England, with the exception of London, is divided into 491 county-court districts, each court having a judge who must be a barrister of at least seven years' standing, and who is appointed by the Lord Chancellor (except the judge within the Duchy of Lancaster, who is paid by salary), is allowed traveling expenses, is addressed as 'His Honor Judge —,' and ranks next after knights bachelors. Some of these judges have a high professional reputation. From the decisions of these courts an appeal lies in many cases to the High Court, and the latter possesses the power of supervising the proceedings of the former by writs of certiorari and prohibition, and by orders to show cause, which have been substituted for the old writ of mandamus.

(3) The *university courts* of Oxford and Cambridge, which exercise civil jurisdiction in some cases in which members of the university are concerned.

(4) *Manorial courts*, having a limited jurisdiction in some parts of the kingdom. See MANOR.

(b) The *superior courts* of England, prior to the Judicature Act of 1873, embraced those of Common Law and of Equity, the Probate and Divorce Court, the Admiralty Court, and the London Court of Bankruptcy. The superior courts of common law and of equity were evolved from the *Aula Regis*, or Great Council of the Kingdom. It was provided by Magna Charta that "common pleas shall not follow one court, but shall be holden in some certain place." Accordingly, new justices were appointed, and the *Court of Common Pleas* was established at Westminster Hall, with jurisdiction over all civil actions between individual litigants—that is, over all common pleas or suits, as distinguished from pleas of the Crown or criminal actions. A century later Edward I. detached from the *Aula Regis* the *Court of King's Bench*, the *Court of Exchequer*, and the *Court of Chancery*, thus settling the superior courts of law and equity upon the basis which they occupied until recently.

Originally the *King's Bench* (or *Queen's Bench* during the reign of a queen) was a criminal court and the conservator of the public peace. By a series of fictions, however, its jurisdiction was extended to civil actions.

So the *Exchequer*, which at first was a court of revenue only, extended its jurisdiction by fictions to a variety of suits between individual litigants.

Under Edward I. the *Court of Chancery* (q.v.) became an established judicial tribunal. It was presided over by the Chancellor, who had the custody of the Great Seal, and with it the power

to issue writs returnable in chancery, and thus to act as a check upon the common-law courts. Later the Lord Chancellor was assisted in the performance of his judicial functions by the master of the rolls and by vice-chancellors. For the influence of this court upon the development of English law, see CHANCERY; EQUITY.

(c) Reference has been made already to the fact that one of the presiding officers of the Anglo-Saxon local courts was a bishop. After the Norman Conquest the bishops ceased to take part in those assemblies, and were accorded exclusive cognizance of spiritual matters. This jurisdiction was steadily extended until it embraced not simply the discipline of the clergy and the regulation of ecclesiastical affairs, but also the control of marriage and divorce, and the disposition of the estates of deceased persons. At present, however, *ecclesiastical courts* in England are confined to the decision of ecclesiastical questions, while divorce and matrimonial causes, as well as the probate (q.v.) of wills and testaments and the administration of decedents' estates, are within the jurisdiction of secular courts.

(d) The *Court of Admiralty* is one of great antiquity, having its origin, undoubtedly, in the period when the King was in truth the source of all judicial power. After the courts of common law, described above, acquired a degree of independence of the sovereign, they did not hesitate to issue writs of prohibition to the Court of Admiralty, and to treat it as an inferior tribunal. Its present jurisdiction is mainly statutory.

The *London Court of Bankruptcy* was created and regulated by modern bankruptcy (q.v.) statutes.

(e) By a series of judicature acts, beginning with that of 1873, all of the foregoing secular courts were consolidated into one *Supreme Court*. This consists, at present, of two permanent divisions, one of which, styled *His Majesty's High Court of Justice*, has original jurisdiction of all actions formerly brought in either of the superior courts of common law or of equity, or in the admiralty, or probate, or divorce, or bankruptcy courts; and an appellate jurisdiction over various cases brought up from inferior courts. The other division is styled *His Majesty's Court of Appeal*, its jurisdiction being almost exclusively appellate. The High Court is separated into three parts, known respectively as the *Chancery Division*, with the Lord Chancellor as president, and five judges; the *King's Bench Division*, with the Lord Chief Justice as president, and fourteen judges; and the *Probate, Divorce, and Admiralty Division*, with a president and a judge; the general character of the subjects of which each division has cognizance being indicated by its name.

The *Court of Appeal* consists of the Lord Chancellor, every person who has held the office of Lord Chancellor, the Lord Chief Justice, the Master of the Rolls, the president of the Probate, Divorce, and Admiralty Division, and five judges, with the title of Lords Justices of Appeal. It is an august tribunal, whose decisions of appeals from the various branches of the High Court command great respect.

In addition to this permanent and impressive Appellate Division of the Supreme Court, there are divisional courts, in the *King's Bench Divi-*

sion and in the Probate, Divorce, and Admiralty Division, composed of two judges, ordinarily, for the disposition of appeals from the petty or quarter sessions, from the county court, and from divers other inferior tribunals.

(f) Above the Supreme Court, as a final court of appeal, is the *House of Lords*, whose appellate jurisdiction dates back to the thirteenth century. At present, however, only a few of its members take any part in the performance of its judicial functions. They are known as *Lords of Appeal*. The Lord Chancellor presides over them. (See LORDS, HOUSE OF.) The final court of appeal for cases arising in India and the colonies is the Privy Council (q.v.), which has also final appellate jurisdiction over judgments of the ecclesiastical courts and of the Naval Prize Court.

From the foregoing sketch of the English courts it is apparent that a litigated case may be passed upon by four successive tribunals. It may be instituted, for example, in a county court, thence appealed to a divisional court, thence to the Court of Appeals, and finally to the House of Lords. A similar series of appeals may terminate in the Privy Council.

II. In the United States, distinct systems of courts exist, one organized under the Federal Constitution and statutes, the others under the Constitution and statutes of the several States.

FEDERAL COURTS. (a) Sec. 1 of Art. III. of the Federal Constitution declares that "the judicial power of the United States shall be vested in one Supreme Court, and in such inferior courts as Congress may from time to time establish." By the second section of the same article, as modified by the Eleventh Amendment to the Constitution, the judicial power of these courts is extended to all cases in law and equity arising under the Federal Constitution, laws, and treaties; to all cases affecting foreign ambassadors, ministers, or consuls; to all admiralty and maritime cases; to controversies to which the United States shall be a party; to controversies between two or more States, between citizens of different States, between citizens of the same State claiming lands under grants of different States, between a State or the citizens thereof and foreign States, citizens, or subjects; and to suits by a State against a citizen of another State.

(b) Under the power conferred upon it to establish judicial tribunals inferior to the Supreme Court, Congress has established a Court of Claims, district courts, circuit courts, and circuit courts of appeal. Besides these, it has provided for various courts in the Territories. The latter are not, however, United States courts under article three of the Constitution, but are rather Congressional courts. They are called into being as an incident to the Congressional authority to make all needful rules and regulations respecting the territory of the United States. Their judges are not entitled to hold office during good behavior, but may be appointed for a term of years, and may be subject to suspension or removal from office by the President.

(c) The *Court of Claims* was established in 1855 to hear and determine certain classes of claims against the United States, thus permitting citizens in many cases to sue the Government. See CLAIMS, COURT OF.

(d) By the act of 1789 the States were divided into thirteen districts, which have increased to sixty-nine (1902), each district having a judge, a clerk, a marshal, and an attorney appointed by the Federal Government. The district courts have an extensive jurisdiction, embracing jurisdiction over admiralty (q.v.) and maritime causes; suits arising under the revenue laws, the civil-rights statutes, and various other legislation; prosecutions for crimes against the United States or for the recovery of penalties under Federal laws: proceedings in bankruptcy, and many other subjects of litigation. See DISTRICT COURT.

(e) Next above the district courts are the *circuit courts*, originally six, now nine, in number, exercising both an original and appellate jurisdiction. They have original jurisdiction over many subjects concurrently with the State courts or the district courts. For example, many criminal prosecutions may be instituted either in the district court or the circuit court; and many civil actions, both of a common-law and of an equitable nature, may be brought in a State court or in a United States Circuit Court at the option of the plaintiff. In some civil suits, the amount involved, exclusive of interest and costs, must exceed \$2000, in order that suit may be instituted in a circuit court. Most cases brought in one of these courts are controversies in which the United States or a State is the complainant, or are between citizens of different States, or involve rights secured by the Federal Constitution, or by Federal statutes or treaties. Originally these courts were held by members of the United States Supreme Court and by district judges, the Chief Justice and each of the associate justices of the Supreme Court spending a part of each year in the conduct of a circuit court. Later, circuit judges were provided for, the number being twenty-five at present (1902); and circuit courts may be held by a Supreme Court justice, or a circuit court judge, or a district judge, or by any two of these. The process of these courts runs to any part of the United States, so that a warrant of court issued by the circuit court in Florida may be served by a United States marshal in Alaska.

(f) By an act of Congress passed in 1891, the appellate jurisdiction of the circuit courts has been transferred to the circuit courts of appeal, of which there are nine—one in each circuit. Each of these courts consists of three judges, any two of whom constitute a quorum. Its members are selected from the following list: The Supreme Court justice assigned to the circuit in question, the circuit judges and the district judges of that circuit; but no justice or judge is allowed to sit in this tribunal in a case which was tried before him while holding a circuit or district court. It is apparent, therefore, that the personnel of these courts changes frequently.

(g) The final appellate tribunal of the Federal judiciary is the *Supreme Court*—probably the most unique and the most influential judicial body in the world. See SUPREME COURT OF THE UNITED STATES.

III. The State courts are modeled after those of England. It is true they do not include admiralty nor ecclesiastical tribunals; but this is because admiralty and maritime jurisdiction is confided exclusively to the Federal courts by

the Federal Constitution, and because there is no State Church in any of our commonwealths. That part of the powers of the English ecclesiastical courts relating to the estates of deceased persons and kindred subjects has been devolved in many States upon tribunals bearing various names, such as surrogates', probate, or orphans' courts. Most of the local or inferior courts, however, as well as the superior courts of law and of equity, were copied by State constitutions and statutes from English originals. In many of the States courts of chancery (q.v.) and of common law (q.v.) have been united into a single supreme court. It is impossible in this article to describe the judiciary system of each of the States, for in matters of detail they differ not a little; but a brief sketch of the New York courts will give the reader an idea of those existing in other States.

(a) To some extent these courts correspond to the territorial subdivisions of the State. For example, each town (q.v.)—the territorial unit in New York—is required to elect *justices of the peace* (q.v.), who are empowered to hold courts and to exercise a limited criminal as well as civil jurisdiction. In each county a *county court* is provided for, and also a *surrogate's court*; although in some counties these courts are held by the same judge. Other local courts, with a limited jurisdiction, have been erected by the Legislature, especially in cities and large villages. The *Supreme Court* possesses a general jurisdiction in law and equity throughout the State. It is composed (1902) of seventy-six justices, each of which is empowered to hold court in any county, although they are not elected by the State at large, but each is chosen by the electors in one of the eight judicial districts into which the State is divided. Some of these justices hold courts for the trial of cases or the determination of motions; while others, upon the selection of the Governor, constitute four courts of appeal, called *appellate divisions*, the State being divided into four departments, in each of which one of these courts has appellate jurisdiction. From determination by an appellate division an appeal may be taken in many cases (see Art. VI., § 9, of New York Constitution) to the *Court of Appeals*, the highest regular judicial tribunal of the State, from whose decision there is no appeal. It consists of a chief judge and six associate judges. A *Court of Impeachments* is also provided for by the State Constitution. This, however, is not a regular, but an extraordinary, tribunal, which rarely assembles.

(b) In some States the Supreme Court possesses original jurisdiction, and is also the final court of appeals. That is the case in Massachusetts, where an action brought in the Supreme Court may be tried and decided by a single justice, and from his decision an appeal may be taken to the full court. In that State the Supreme Court is the final tribunal for appeals from the decisions of a single justice; also from the Probate Court, the Insolvency Court, and the Superior Court—the Superior Court, in turn, possessing both original and appellate jurisdiction, appeals running to it from municipal, district, police, and justice courts.

Consult: *Encyclopædia of the Laws of England* (London, 1897); Curtis, *Jurisdiction of the United States Courts* (2d ed., Boston, 1896);

Foster, *Treatise on Federal Practice* (Chicago, 1901); Cummings and Gilbert, *Official Court Rules of New York* (New York, 1900); The United States Constitution and Revised Statutes; the Constitutions and Statutes of the several States. For a separate treatment of special courts, see individual titles such as COMMON PLEAS, COURT OF; SURROGATE; COURTS, MILITARY; PROBATE COURT; ARCHES, COURTS OF; SUPREME COURT OF THE UNITED STATES; etc. Consult also the authorities referred to under such titles as CIVIL LAW; ADMIRALTY LAW; PLEADING; etc.

COURT. A name originally applied to the square or space inclosed by the buildings of a feudal castle. In time it came to denote the persons immediately surrounding a feudal chief or superior. Its application is now confined to the residence and surroundings of sovereign princes, together with such persons of distinction as are in the habit of approaching the monarch and of associating with the other members of the royal family, both in a public and a private capacity.

COURT, PRESENTATION AT. What in monarchical countries is considered the honor of being presented at Court or formally introduced to the sovereign, is valued not only for the *éclat* of the ceremonial, but also for its service as a credential. Having been received by his *own* sovereign, a person may expect to be received anywhere else, and may claim to be presented by the representative of his country at any foreign Court. The privilege is therefore carefully guarded from abuse; and during her long reign, Queen Victoria exercised the most scrupulous personal supervision over the names of those who sought the honor, excluding all whose reputation was in the slightest degree tarnished. In England the names of those desiring to be presented, and of their presenters, must be sent to the Lord Chamberlain's office several days previously for approbation. Those who are not British subjects may be presented by their own ambassador. An elaborate ceremonial, including the wearing of full Court dress, is connected with the ceremony. For fuller information as to court dress, etc., consult Armytage, *Old Customs and Modern Court Rules* (London, 1883).

COURT, KŌŪR. ANTOINE (1696-1760). A French Reformer called the 'Restorer of Protestantism in France.' He was born at Villeneuve de Berg, in Languedoc, March 27, 1695. His parents were peasants, adherents of the Reformed Church, which was then undergoing cruel persecution. When but seventeen years old Court began to speak at the secret meetings of the Protestants, held literally 'in dens and caves of the earth,' and often in darkness, with no pastor present to teach or counsel. He entertained a great desire to build up the Church so ruthlessly persecuted; and to this end he proposed four things: (1) regular religious meetings for teaching and worship; (2) suppression of the fanaticism of those who professed to be inspired, and of the consequent disorders; (3) restoration of discipline by the establishment of consistories, conferences, and synods; (4) the careful training of a body of pastors. To the performance of this great task he devoted his life. From audiences of half a dozen meeting in secret, he came to address openly 10,000 at one time. In

1715 he convoked the first Synod of the Desert. In 1724 further fury was hurled at the Protestants in a decree which assumed that there were no Protestants in France, and prohibited the most secret exercise of the Reformed religion. A price was set on Court's head, and in 1729 he fled to Lausanne. There, after great exertion, he founded a college for the education of the clergy, of which, during the remaining thirty years of his life, he was the chief director. This college sent forth all the pastors of the Reformed Church of France until the close of the eighteenth century. He died at Lausanne, June 13, 1760. Court intended to write a history of Protestantism, and made extensive collections for the purpose; but he did not live to do the work. He wrote, however, *An Historical Memorial of the Most Remarkable Proceedings Against the Protestants in France from 1744-51* (Eng. trans., London, 1732); *Histoire des troubles des Cévennes ou de la guerre des Camisards* (1760; new ed., Alais, 1819, 3 vols.). Consult his *Autobiography*, ed. by E. Hugues (Toulouse, 1885); his *Letters*, from 1739, ed. by C. Dardier (Paris, 1885, 1891); E. Hugues, *Antoine Court* (Paris, 1872); id., *Les synodes du désert* (3 vols., Paris, 1885-86); and H. M. Baird, *The Huguenots and the Revocation of the Edict of Nantes* (New York, 1895). His only son, ANTOINE COURT DE GÉBELIN (born at Nîmes January 25, 1725, died in Paris May 10, 1784), who took the name of his grandmother, was a literary man of recognized rank, and rendered excellent service, first as his father's amanuensis and assistant and afterwards as a scholar at the capital. He is remembered in connection with the famous case of Jean Calas (q.v.) by his work *Les Toulousaines, ou lettres historiques et apologetiques en faveur de la religion réformée* (Lausanne, 1763).

COURTAT, kōōr'tā', LOUIS (1847—). A French painter. He was born in Paris and studied there under Cabanel. He has exhibited frequently at the Salon, and his "Leda" (1874) was bought by the French Government for the Luxembourg.

COURT BARON (Lat. *Curia Baronis*). The domestic court of the lord of a manor. Such courts were incident to every manor, barony, or lordship of land, in the Anglo-Saxon period of English history, and in subsequent ages came to be regarded as the characteristic and essential quality of a manor, inasmuch that Coke declares that "a court baron is the chief prop and pillar of a manor, which no sooner faileth, but the manor faileth to the ground." Being of customary origin, and custom being a matter of immemorial usage, no new courts baron, and consequently no new manors, can be created, and it is asserted by Blackstone that all manors existing in his time "must have existed as early as King Edward the First." However this may be, the manorial courts of which we have any knowledge are of great antiquity, though those that remain have by successive acts of Parliament and social changes been reduced to mere shadows of their former authority and importance, most of them having to-day only a nominal existence.

The court baron was and is the court of the freeholders of the manor, as distinguished from the villeins and copyholders. The lord, or his

steward, is the presiding officer of the court, which is composed of those freehold tenants of the manor who owe, as one of the services or incidents of their tenure, the service of 'suit,' or attendance, at the court. While the judicial functions of the court varied considerably, according to the customs of the manor, in general it exercised an ordinary jurisdiction in civil suits among the tenants of the manor, determined proprietary rights to land, regulated rights of common, sanctioned grants of the waste, etc. Until the reform of legal procedure in England in 1833, the great proprietary action for the recovery of land, known as the 'writ of right,' was properly instituted in the court baron, though the great authority of the regular tribunals of the kingdom had long since brought safer and more convenient processes within the reach of persons asserting claims to land. Many of the manorial courts have died out from the lack of a competent number of 'suits,' i.e. freemen subject to do suit at court.

A species of court baron existed in the manors created by royal patent in the Province of New York in the seventeenth and eighteenth centuries. These were modeled after the historic courts baron of the mother country, and for a time enjoyed considerable authority. They were abolished with the manors to which they were incident in the revolutionary legislation of 1787. Consult: Bolton, *History of the Several Towns, Manors, and Patents of the County of Westchester, New York*; Digby, *History of the Law of Real Property* (5th ed., Oxford, 1898); Pollock and Maitland, *History of English Law* (2d ed., London, 1899); Maitland, *Select Pleas in Manorial Courts* (Selden Society, 1889); Introduction: Gurdon, *History . . . of Court Baron and Court Leet* (London, 1731). See COURT LEET; CUSTOMARY LAW; MANOR.

COURT BEGGAR, THE. A play by Richard Brome (1632).

COURTENAY, kērt'nā, EDWARD HENRY (1803-53). An American mathematician, born in Maryland. He graduated in 1821 at the United States Military Academy, where until 1824 he was an assistant professor. In 1829-34 he was professor of natural and experimental philosophy there, in 1834-36, professor of mathematics at the University of Pennsylvania, and in 1842-53 professor of mathematics at the University of Virginia. He was an engineer in the construction, in 1837-41, of Fort Independence in Boston Harbor, and in 1841-42 was chief engineer of the dry-dock work in the Brooklyn Navy-yard. He translated and edited the *Elementary Treatise on Mechanics* of Boucharlat (1833), and prepared a *Treatise on the Differential and Integral Calculus, and the Calculus of Variations* (1855).

COURTESY. See CURTESY.

COURTESY TITLES. See TITLES OF HONOR.

COURT FOOL. From very ancient times there existed a class of persons whose business it was to while away the time of the noble and the wealthy, particularly at table, by jests and witty sayings. The custom is so old that it is mentioned in the great Sanskrit epic *Ramāyana* (q.v.). Plutarch speaks of a jester owned by the King of Persia. Philip of Macedon, Attila, Harun-al-Raschid, and even Montezuma employed them. Only with the Middle Ages, however, did

the office of court fool become a regular and indispensable function. At the end of the fourteenth century the fashion developed rapidly. Queens, dauphins, dukes, and wealthy barons all maintained their fools. The symbols of such a personage were: the shaven head; the fool's cap of gay colors with ass's ears and cock's comb; the fool's sceptre, which was variously formed; the bells, which were mostly attached to the cap, but in some cases to other parts of the dress; and a large collar. The rest of the costume was regulated by the taste of the master. Of these professional fools, some obtained an historical reputation, as Triboulet, jester of King Francis I., of France, and his successor, Brusquet; Klaus Narr, at the Court of the Elector Frederick the Wise of Prussia, and Scogan, court fool to Edward IV. of England. The kings and regents of Scotland had their jesters; and the sarcastic sayings of some of these privileged personages—such as those of Patric Bonny, jester to the Regent Morton—are still remembered. English court jesters died out with the Stuarts, one of the last of the race being the famous Archie Armstrong. Besides the regular fools recognized and dressed as such, there was a higher class, called merry counselors, generally men of talent, who availed themselves of the privilege of free speech to ridicule the follies and vices of their contemporaries. Of these, Knuz von der Rosen, jester to the Emperor Maximilian I.; John Heywood, a prolific dramatic poet and epigrammatist at the Court of Henry VIII.; and Angely, a French courtier, were particularly distinguished for talent and wit. In all times there have existed at courts persons who, without becoming jesters by profession, were allowed the privilege of castigating the company by their witty and satirical attacks, or who served as an object for the wit of others. Among these were the Saxon general Kyaw, celebrated for his blunt jests; and the learned Jacob Paul, Baron Gundling, whom Frederick William I. of Prussia, to show his contempt for science and the artificial Court system, loaded with titles. Often imbecile or weak-minded persons were kept for the entertainment of the company. The custom survived long in Russia, where Peter the Great had so many fools that he divided them into distinct classes, and kept them with him wherever he went. As late as the nineteenth century the Czar of Russia kept a jester at court, and in France just before the Revolution Marie Antoinette had her fool. Consult: Nieck, *Die Hof- und Volksnarren* (Stuttgart, 1861); Flögel, *Geschichte der komischen Litteratur* (Leipzig, 1784); and Doran, *History of Court Fools* (London, 1858).

COURTHOPE, WILLIAM JOHN (1842—). An English author. He was born July 17, 1842; was educated at Harrow and at New College, Oxford, where his career was most distinguished; was appointed professor of poetry at Oxford (1893), and honorary fellow of New College (1896). As professor of poetry he has delivered valuable lectures on *Life in Poetry*. Among his publications are *Ludibria Luna*, an allegorical burlesque (1869); *The Paradise of Birds*, a fine extravaganza (1870); *Life of Addison* (1882); an exhaustive history of English poetry, of which two volumes (1895-97) have appeared. He also edited, with biography, five volumes of the standard edition of Pope (10 vols., 1871-89).

COURT LEET (from *court* + *leet*, AS. *lode*, OHG. *liut*, Ger. *Leute*, people; connected with OCh. Slav. *Gudŭ*, Lett. *laudis*, people, and ultimately with Skt. *ruh*, to grow). In English law, a local customary court of great antiquity and of a popular character, having a limited criminal jurisdiction. It has been declared to be "the most ancient court in the land for criminal matters, the court baron being of no less antiquity in civil," and it is supposed to have been derived from the Anglo-Saxon folk-mote, in contradistinction, perhaps, to the 'hall-mote,' or court baron, which consisted of the freeholders, sitting in the hall of the manor.

Though usually found in connection with manors, the leet was not, properly speaking, a manorial court. There were town leets, borough leets, and hundred leets. But it was in connection with the manor, to whose internal organization it was peculiarly adapted, that the court leet reached its highest development. Though held by the steward, with the aid of the freemen of the manor (they were not required to be freeholders, as in the court baron), it was still regarded as belonging to the King. It was, in effect, a royal magistrate's or police court, having complete jurisdiction only of minor offenses (misdemeanors) and the jurisdiction of a committing magistrate in cases of felony and treason. These latter it referred to the superior tribunals of the country for trial and punishment. The court has now completely lost its importance, having been superseded by the police and county courts, though it still has a nominal existence in some manors. See **COURT BARON**; **MANOR**; and consult the authorities referred to under **MANOR**; also Jacob, *Law Dictionary* (title, "Court Leet") (London, 1809); Pollock and Maitland, *History of English Law* (2d ed., London and Boston, 1899); Gurdon, *History . . . of Court Baron and Court Leet* (London, 1731).

COURTLY, CHARLES. Sir Harcourt Courtly's son, in Dion Boucicault's *London Assurance*, believed by his father to be mild and studious, while in reality he is a fast young man of fashion.

COURTLY, SIR HARCOURT. An old beau in Dion Boucicault's *London Assurance*. His son Charles wins away from him the heiress he was to marry.

COURTLY NICE, SIR. An insignificant fop, the principal character of Crowne's comedy *Sir Courtly Nice*.

COURTMANS-BERCHMANS, kōōr'māns bĕrk'māns, JOANNA (1811-90). A Flemish author, born at Oudegend, East Flanders. After the death of her husband in 1856, she conducted a school at Maldegem. She was closely identified with the movement aiming at the advancement of Flemish literature. Several of her poems and novels enjoy great popularity. They include: *Het geschenk van den jager* (1864); *De zwarte Haave* (2d ed., 1866); *De Koewachter* (1873); *De Hoogmoedige* (1882).

COURT-MARTIAL. See **COURTS**, MILITARY.

COURTNEY, kĕrt'nĭ, LEONARD HENRY (1832—). An English Liberal-Unionist statesman, born at Penzance. He graduated at Cambridge in 1853, and was called to the bar three years later. From 1872 to 1875 he occupied the chair

of political economy at University College, London. He was several times elected to Parliament and became Under-Secretary of State for the Home Department in 1880, and for the Colonies in 1881; Governor of Madras in 1882; and Privy Councillor in 1889. He served on the Labor Commission in 1893-94, and became known as a strong advocate of proportional representation.

COURTNEY, WILLIAM LEONARD (1850—). An English author. He was born at Poona, India, January 5, 1850; was educated at University College, Oxford; elected fellow of Merton College (1872), and of New College (1876); afterwards headmaster of Somersetshire College, Bath (1873), and has been editor of the *Portnightly Review* since 1894. Among his scholarly works are: *The Metaphysics of John Stuart Mill* (1879); *Studies on Philosophy* (1882); *Constructive Ethics* (1886); *Studies New and Old* (1888); *Life of John Stuart Mill* (1889); *The Idea of Tragedy* (1900).

COURT OF CHIVALRY. See CHIVALRY, COURT OF.

COURT OF CLAIMS. See CLAIMS, COURT OF.

COURT OF COMMON PLEAS. See COMMON PLEAS, COURT OF.

COURT OF INQUIRY. See COURTS, MILITARY.

COURT OF LIONS. The most famous court of the Alhambra, taking its name from twelve white marble lions from whose mouths streams of water flowed into a central alabaster basin. The tiled court is surrounded by 124 columns delicately ornamented in filigree and colors, supporting a low gallery. For illustration, see ALHAMBRA.

COURT OF LOVE (Fr. *Cour d'Amour*). The name applied in the later Middle Ages to groups of noble ladies who, often, while assembled to listen to the declamations of the troubadours, took occasion to decide upon questions of courtesy and etiquette, particularly in affairs of love. According to some authorities these courts formed regular institutions during the twelfth century, the custom flourishing especially in Provence. There was a code (still preserved) of thirty-one articles called *De Arte Amatoria et Reprobatione Amoris*, by André, a royal chaplain, who lived in the middle of the twelfth century. Decisions are said to have been based upon this code. A typical example of the questions submitted to such tribunals is the following: If a lady listened to one admirer, pressed the hand of another, and touched with her toe the foot of a third, which of these three was the favored suitor? Among the eminent ladies who presided over these 'courts' were Queen Eleanor of Guienne and her daughter Marie de France, Countess of Champagne. René of Anjou, in the fifteenth century, made an ineffectual effort to resuscitate these 'courts.' Consult: Meray, *La vie au temps des cours d'amour* (Paris, 1876), and Reynouard, *Choix de poésies originales des troubadours*, vol. ii. (Paris, 1817).

COURT OF LOVE, THE. A poem assigned to Chaucer, but possibly of later origin. It appears in the edition of 1561.

COURT OF REQUESTS. An inferior court of equity jurisdiction, instituted in the reign of Henry VIII. for the purpose of affording relief

to the Lord Chancellor. Its authority was limited to cases coming within the jurisdiction of the High Court of Chancery, but deemed of too small importance to engage the attention of that august tribunal. It was presided over by the Lord Privy Seal, assisted by judges known as Masters of Requests. It never attained to great importance, and was abolished by act of Parliament in 1641 (Stat. 16 and 17 Car. I., c. 10).

The courts of conscience were also known as courts of requests. See CONSCIENCE, COURT OF.

COURT OF SESSION. The highest civil tribunal in Scotland, instituted in the reign of King James V., by statute dating May 17, 1532. The object of its institution was to discharge the judicial functions which originally belonged to the King and his council, and which, since 1425, had in a great measure devolved on a committee of Parliament, as the great council of the nation. The Court of Session consisted at first of fourteen ordinary judges and a president. One-half of these judges and the president were Churchmen, and the practice of appointing ecclesiastics to the bench did not cease for some time even after the Reformation. The King had the privilege of appointing, in addition to the ordinary judges, three or four peers or members of his great council, to sit and vote with the lords of session. The Lord Chancellor was president of the session. His office was abolished at the union, and the habit of appointing peers gradually fell into disuse.

From its foundation, till 1808, the court of session consisted of one court; in that year it was divided into what are known as the first and second divisions, two separate courts possessing coördinate jurisdiction. The lord president is still president of the whole court when called together for consultation, and enjoys other privileges in that capacity; but on ordinary occasions he officiates simply as president of the first division. In 1830 the number of judges in the Court of Session was reduced to thirteen; and that is still the full number, though since 1877 there have actually been but twelve judges. Of the five lords ordinary, only four sit daily. The judgments of the outer house, with a few statutory exceptions, are appealable to the inner house. The youngest judge, or junior lord ordinary, officiates in a separate department of the outer house, called the bill chamber, where summary petitions and other branches of business peculiarly requiring dispatch are disposed of. This department alone is open during the vacations of the court, the judges, with the exception of the lord president and lord justice-clerk, officiating in it in rotation. Either division of the Court of Session may call in the aid of three judges of the other, when equally divided in opinion. In cases of still greater difficulty, the lords ordinary are also called in, and a hearing before the whole court, or *in prescnee*, as it is called, takes place.

Since the 31st and the 32d Vict., cap. 100, no hearings before the whole court have taken place; the cases being decided on written arguments submitted to the judges. The judges of the Court of Session are appointed by the Crown, and hold their offices for life. No one is eligible to the office unless he has served as an advocate or principal clerk of session for five years or as a writer to the signet for ten years. See COURT.

COURTOIS, koor'twä', GUSTAVE CLAUDE ETIENNE (1852—). A French figure and portrait painter, born at Pusey, Haute-Saône. He studied with Gérôme in Paris, and afterwards was frequently honored at exhibitions. In 1889 he won the first medal at the Paris Exposition. His genre and historical pictures include "Narcisse" (bought for the Luxembourg), and "Dante and Virgil in Hell," but the strength of his art is more truly shown in his portraits.

COURTOIS, JACQUES (1621-76). A French battle painter, better known as Le Bourguignon. He was a pupil of his father, Jean Courtois, but went to Italy at the age of fifteen and worked in Bologna, Florence, Siena, and Rome, influenced successively by Guido Reni and Francesco Albani in Bologna, and by Cerquozzi and Pieter de Laar in Rome. He was turned to his true field, however, by a study of Raphael's "Battle of Constantine" in the Vatican. His spirited battle scenes, which excited great admiration and found many imitators, are to be seen in most of the principal galleries of Europe. At the age of thirty-six, on the death of his wife, he entered a Jesuit convent as a lay brother, and is said to have executed thereafter a number of religious paintings. By the Italians he was called Jacopo (or Giacomo) Cortese and Il Borgognone.

COURT PARTY, THE. A term applied as early as 1620 to the supporters of the political policy of the Stuart dynasty as opposed to the *Country Party*, during the disputes of King and Commons. At the end of the century the party represented high Toryism, Jacobitism, and High Church principles.

COURTRAI, koor'trä' (Flemish *Kortryk*). A town in the Province of West Flanders, Belgium, on the Lys, or Leye, 30 miles south of Bruges (Map: Belgium, B 4). Courtrai is built on both sides of the river, is surrounded with walls, and has a castle, a citadel, a fine old bridge flanked with Flemish towers, a noble town hall, and a beautiful Gothic church, founded in 1238 by Baldwin, Count of Flanders. The town-hall, dating from the sixteenth century, and now restored, contains memorable chimney-pieces and noteworthy frescoes and statuettes. In the Church of Notre Dame is one of Van Dyke's most celebrated paintings—"Raising of the Cross." Though a busy manufacturing place, Courtrai is nevertheless attractive. Table damask and other linen are the principal articles of manufacture, and for which Courtrai is celebrated, as well as for its lace and the excellent quality of flax grown in the vicinity. Population, in 1890, 30,400; in 1900, 34,000. Courtrai dates back to Roman times, when it bore the name of Cortoriaeum. During the Middle Ages it was an important industrial centre. On July 11, 1302, the Flemings, citizens of Ghent and Bruges chiefly, numbering 20,000 men, won a splendid victory over 7000 French knights and 40,000 soldiers, beneath the walls of Courtrai. More than 4000 golden spurs, worn by the French nobility, were gathered from the field, and the battle was henceforth called the Battle of the Spurs. The town suffered greatly in the French wars of the seventeenth and eighteenth centuries.

COURTS, MILITARY. Military courts are distinguished from civil courts both in their organization and procedure. They are divided into

courts-martial and courts of inquiry, which in their various forms are described below.

COURTS-MARTIAL (Fr., military courts) are statutory institutions for the enforcement of order and discipline in armies and navies. The American Army is governed by a military code mainly derived from that of England. The military tribunals instituted in America and England for the administration of this code do not differ materially in composition, power, or procedure. The court of the constable and marshal recognized in the statute of Richard II. c. 2 appears to have been the first in England to administer military justice. The office of high constable was abolished in the reign of Henry VIII., and with it lapsed all the criminal jurisdiction of this court. From this time until 1689, when military courts were recognized by statute, military law was administered by means of commissioners, by the general in command of troops, or by means of deputies appointed by him. These commissioners or deputies were usually officers of the army, and constituted courts or councils of war. Some time prior to the passing of the Mutiny Act these councils of war were called courts-martial, and with few modifications are now the existing military tribunals.

American courts-martial are instituted by authority of Congress, in pursuance of a power, conferred by the Constitution, to try offenses committed while the party is in the military service. These courts are (1) the general court-martial; (2) the summary court; (3) the garrison court; (4) the regimental court. The jurisdiction of the general court-martial extends to every person subject to military law for any offense within the cognizance of a military court. It is the only military court that can try a commissioned officer, and it takes cognizance of the serious offenses committed by enlisted men. The power to assemble a general court-martial is given by statute to the President of the United States and to any general officer commanding an army, a territorial division, or department, or colonel commanding a separate department. In time of war the commander of a division or of a separate brigade of troops is empowered to appoint this court. The statute provides that a general court-martial may consist of any number of officers from five to thirteen inclusive, and that it shall not consist of less than thirteen when that number can be convened without manifest injury to the service. The officers who are competent to appoint a court-martial are competent to appoint a judge-advocate for the same. The judge-advocate prosecutes in the name of the United States, and is, under certain circumstances, counsel for the prisoner. He summons witnesses for prosecution and defense. The original charges are sent to this officer, and if he considers any amendment necessary he communicates with the officer appointing the court. When the convening officer has satisfied himself that the charge preferred discloses an offense under the Articles of War (q.v.), and that the evidence forthcoming is sufficient to justify the trial of the accused, he issues an order defining the place and time of the meeting of the court, and naming, in the order of their rank in the service, the officers who are to compose it.

When a commissioned officer is to be tried the officer appointing the court details, if he can, without prejudice to the service, officers of rank

equal or superior to that of the accused. He also avoids detailing the officer who has investigated the charges against the accused, or one who will be a principal witness against him, or the immediate commanding officer of the accused. A member of a court of inquiry respecting the matter on which the charges are founded, or an officer who has a personal interest in the case, is not detailed. Court-martial procedure does not differ materially from that of the ordinary criminal courts of the country. This court is, however, a judge of the law as well as of the facts of the case it tries. Before it proceeds upon any trial the judge-advocate administers an oath to each member which requires him, as a juror, to well and truly try and determine, according to evidence, the matter . . . before him, etc., and as a judge to duly administer justice without partiality, favor, or affection, etc. This oath includes also one of secrecy as to the votes of members, and of the sentence of the court, until approved. The judge-advocate is also required to take a similar oath of secrecy. Congress has power to prescribe not only the organization and jurisdiction of courts-martial, but also their practice, and the mode of executing their sentences. It has secured to the accused a right of challenge to a member of his court, and immunity from a second trial for the same offense. It has fixed the period of time within which the accused must be prosecuted. The form of procedure for a general court-martial is laid down in works treating of the subject of military law.

SUMMARY COURTS-MARTIAL have been instituted for the purpose of trying enlisted men for offenses ordinarily cognizable by garrison or regimental courts-martial, which courts they have practically displaced. This court, as instituted in the United States, has no power to try capital cases or commissioned officers. In England this court has been instituted for the purpose of trying offenses committed in active service, which, with due regard to the public service, could not be tried by the ordinary courts. It is competent to try any officers, soldiers, or other persons subject to military law for any offense, and if composed of three officers, can award all the punishments of a general court-martial. In the United States the summary court is composed of a single officer, and has power to try, in time of war, as well as of peace, enlisted men and general prisoners. Its power to punish is limited by statute. The commanding officers authorized to approve its sentences, and superior authority, have power to remit or to mitigate them.

GARRISON COURTS-MARTIAL are composed of three members and a judge-advocate. All are commissioned officers. They may be appointed by any officer commanding a garrison, fort, or other place where the troops consist of different corps. The order appointing a garrison court must state the fact giving it jurisdiction. As regards persons, offenses, and limit of power to punish, its jurisdiction does not differ from that of the summary court. In the military service of the United States this court is now seldom assembled except in the cases of non-commissioned officers objecting to trial by the summary court, and in the event of the accused refusing to consent in writing to trial by that court, when they may be brought to trial before garrison,

regimental, or general courts-martial. The testimony taken before a garrison or regimental court-martial is not reduced to writing. The garrison court-martial corresponds to the district court in the English Army.

THE REGIMENTAL COURT-MARTIAL is in composition the same as a garrison court-martial, with the exception that its members and judge-advocate are of the same regiment or corps as the offender. Every officer commanding a regiment or corps may appoint this court, which has jurisdiction only over offenders belonging to the same regiment or corps from which the court is appointed. In all other respects this court is like the garrison court-martial. In England regimental courts-martial can be convened by any officer authorized to convene the higher courts, by a commanding officer, or officer in command of two or more detachments, provided he be not under the rank of captain, and on board a ship, by a commanding officer of any rank. After investigating the charge against a prisoner a commanding officer, if he does not dispose of the case summarily, must without unnecessary delay, which should not exceed thirty-six hours, either refer the case to superior authority, order a regimental court-martial to assemble, or apply to a superior to convene a higher court. Clode says: "These three 'general,' 'district,' and 'regimental' courts are those under which the army is governed, and by which the military law is administered."

A COURT OF INQUIRY is, in its function, analogous to a grand jury in civil procedure. It is convened to examine into the nature of any transaction of, or accusation or imputation against, any officer or soldier in the service. Unless specially ordered to do so, it does not give an opinion on the merits of the case it investigates. A dissenting opinion is authorized. A court of inquiry may be ordered by the President, or by any commanding officer, but shall never be ordered by a commanding officer, except upon a demand by the officer or soldier whose conduct is to be inquired into. It consists of one or more officers, not exceeding three, and a recorder. The order convening a court of inquiry details the members and recorder by name, specifies the subject matter of inquiry, and directs a report of the facts, or of the facts with opinion. Under the military laws of the United States, a court of inquiry and the recorder thereof have the power to summon witnesses and to take evidence on oath. This is not so in the English service, where it has no judicial power, and is simply a board directed to collect evidence with respect to a transaction into which the commanding officer himself cannot conveniently inquire. A court of inquiry, wrote Sir Charles Napier, "ought generally to be a closed court, no one allowed to enter but such individuals as are called for, and who, being privately examined, are sent out. . . . It is generally objectionable to make a court of inquiry an open court."

MILITARY COURTS OF OTHER COUNTRIES. In the army of Germany there are general and regimental courts. In trials of enlisted men a certain proportion of the members of the court are of the rank of the accused. In the Russian Army there is a supreme tribunal at Saint Petersburg, and district and regimental courts-martial. In the French Army individual officers have large powers of imprisonment, and there

are regiments and courts of discipline for hard characters. In the Austrian Army there are courts of first instance, and courts of appeal from the former. Military lawyers are also attached to each regiment to help in the administration of military justice.

BIBLIOGRAPHY. A *Manual for Courts-Martial* was prepared by direction of the Secretary of War for the use of the Army of the United States in 1901. For the English practice, Simmons, *Courts-Martial* (London, 1873), may be consulted. See **MILITARY LAW.**

COURTSHIP OF MILES STANDISH, THE. A hexametric poem by Longfellow (1858), founded on the life of the "Captain of the Pilgrims."

COURT TENNIS. Indoor tennis (see diagram). Usually the court occupies an entire building, and is lighted from the roof, occupying a playing space of 96 by 32 feet, surrounded on three sides by a corridor about 6 feet wide (the

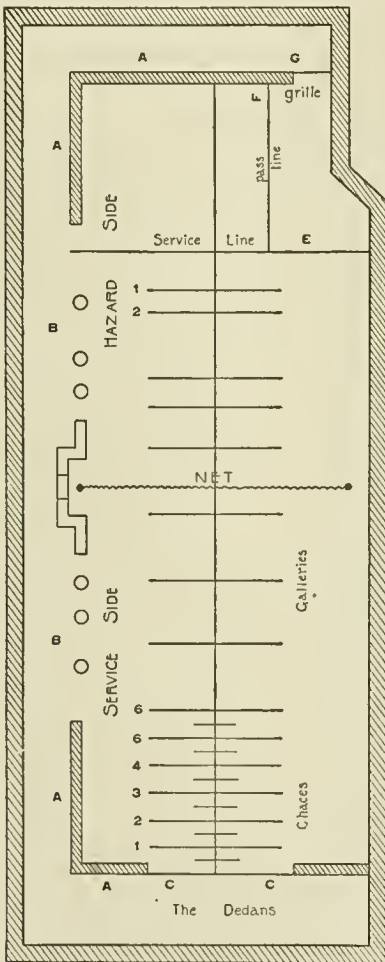
open grating. The most complete courts have floors of asphalt, and cement walls painted black to a height of 18 feet. The nets divide the court, and also the *service* and *hazard* sides of the game. The *tambour* is a projection on the hazard side, resembling a chimney, and near it (in the penthouse) is the *grille*. The *chases* are numbered on the wall (from 1 to 6) and are employed to divide part of the court into the number of spaces required by the game. In playing the game the server must stand in the service court and serve the ball over the penthouse, it being required to strike on the penthouse roof and then roll off into the receiving court. The player on the hazard side strikes it on the bound wherever he chooses, if only it first strikes the ground on the opposite side of the net: for instance, he may strike it against the nearest wall, so that it rebounds across the net. A 'chase' is called when the player fails to strike the ball before the second bound—unless he is on the hazard side and beyond the service-line. Further, a record is made of the cross-lines at which the ball bounds; which, however, does not affect the score unless the game stands at 40, in which event sides are changed and the contestants play for the 'chase.' The player responsible for the 'chase,' by permitting the same to be made, will attempt to return the ball nearer to the end wall than the point at which it was marked, to insure its bounding a second time, making the attempt as often as his opponent returns the ball until he either succeeds or misses. In the former event he is credited with the 'strike;' while in the latter, his opponent scores. For more detailed information regarding the game, its scoring and its history, see **TENNIS.**

COURT THEATRE, THE. A playhouse for comedies and farces, situated in Sloane Square, London. Originally a chapel built in 1818, it was turned into a theatre.

COUSA, JOHN. See **ALEXANDER JOHN I.**

COUSIN, KŌŌ'ZĀN', JEAN (1501-89). A French painter. He was born at Soney, near Sens, and little definite is known of his life. He was at first a glass-painter and afterwards a goldsmith in Paris. His work on glass is celebrated. His windows in the Sainte Chapelle at Vincennes are probably the finest in France, and he also made some for the Church of Saint Gervais, Paris, which, however, have been destroyed. At this period Cousin turned his attention to painting and became known as the 'founder of the French School.' He executed a fine "Last Judgment," which is full of action and spirit, in the manner of Parmigiano. It is now in the Louvre. He was also a miniaturist, sculptor, and a wood-engraver, and the author of two books, *Livre de perspective* (1560) and *Livre de portraiture* (1571). Consult Firmin-Didot, *Etude sur Jean Cousin* (Paris, 1872).

COUSIN, VICTOR (1792-1867). A French philosopher and historian. He was born in Paris, and studied with such brilliant success at the Ecole Normale that in 1814 he was appointed assistant to Royer-Collard in the chair of philosophy at the Sorbonne. He threw himself heartily into the reaction against the sensualistic philosophy and literature of the eighteenth century, which was then in possession of the field. In 1817 he visited Germany, where he was introduced to bolder and more speculative sys-



COURT TENNIS.

penthouse), which has a sloping roof about 7 feet high. The spectators occupy the *dedans*, or the part of the penthouse situated in the rear of the court, and separated from the same by an

tems of philosophy than any he had yet known, becoming acquainted with Jacobi, Schelling, Hegel, and Goethe. During a later visit to Germany, in 1824-25, he was suspected of revolutionary tendencies, arrested in Dresden, and sent to Berlin, where he was detained for six months. He took advantage of his compulsory detention in Prussia to study the philosophy of Hegel, which had no small influence on his susceptible intellect. On his return to France he took a decided stand against the reactionary policy of Charles X., and in 1827, when the comparatively liberal Ministry of Martignac came into office, Cousin, who had for some years been suspended from his professorial functions, was reinstated in his chair. Meanwhile he had become known as an author by his editions of Proclus and Descartes (1820-26), and by his celebrated translation of Plato, which was finished in 1840, in thirteen volumes. Cousin reached the height of his popularity and influence as a philosophic teacher in the years 1828-30, when often as many as two thousand enthusiastic hearers gathered around him. He was still young, simple, and pure in his habits; his doctrines were for the most part new to his audience, bold, and in harmony with the spirit of the time. The finest qualities of the national genius appeared in his lectures—a wonderful lucidity of exposition, and exquisite beauty of style, such as few philosophers have equaled, a brilliancy of generalization and criticism, and a power of coördinating the facts of history and philosophy so as to make each illustrate the other and reveal their most intricate relations. At this period Cousin was one of the most influential leaders of opinion among the educated classes in Paris. After the Revolution of 1830, when his friend Guizot became Prime Minister, he was made a member of the Council of Public Instruction, in 1832 a peer of France, and later director of the Ecole Normale and virtual head of the University. His efforts for the organization of primary instruction are to be seen in the valuable reports which he drew up from personal observation on the state of public education in Germany and Holland. In 1840 he was elected a member of the Académie des Sciences Morales et Politiques, and in the same year became Minister of Public Instruction in the Cabinet of Thiers. After the Revolution of 1848 Cousin aided the Government of Cavaignac, and published an anti-socialistic brochure called *Justice et charité*. After 1849 he disappeared from public life.

Cousin was greater as an expounder of historical systems of philosophy than as an original thinker. At first a disciple of Royer-Collard and the Scottish School, he was attached to the psychological method of investigating; afterwards a keen student of the German School, he expounded the views of Schelling and Hegel with such enthusiasm that he might legitimately enough have been considered a 'German idealist.' But he endeavored to mediate between the German standpoint of an impersonal reason and that of empirical psychology. In the later years of his life his views carried him to a modified Cartesianism. See DESCARTES.

Cousin's chief works, besides those already mentioned and his *Fragments philosophiques* (1826), appeared in two series. The first contained *Premiers essais de philosophie; Du vrai, du beau et du bien; Philosophie sensualiste;*

Philosophie écossaise; Philosophie de Kant. The second contained *Introduction à l'histoire de la philosophie; Histoire générale de la philosophie jusqu'à la fin du XVII^e siècle.* He also contributed a great variety of papers to the French reviews. Besides his philosophical work, he rendered a very real service to the history of the seventeenth century in France by his luminous and stimulating sketches of Mmes. de Longueville, de Hautefort, de Sablé, and a number of other great personages of the period. Consult: Hamilton, *Discussions on Philosophy, Literature, Education, and University Reform* (London, 1852); Taine, in *Les philosophes classiques du XIX^e siècle* (Paris, 1888); Janet, *Victor Cousin et son œuvre* (Paris, 1885); Barthélemy Saint-Lilaire, *Victor Cousin, sa vie, sa correspondance* (3 vols., Paris, 1895); Jules Simon, *Victor Cousin* (Paris, 1887).

COUSINE BETTE, kōō'zēn' bēt. LA. A novel by Balzac (1846) dealing with the love of an aunt and a niece for the same youth.

COUSIN MICHEL, mē'kēl. A humorous appellation for the German native, corresponding to Brother Jonathan as applied to the American.

COUSIN-MONTAUBAN, kōō'zān' mōn'tō'bān', CHARLES GUILLAUME MARIE, Count of Palikao (1796-1878). A French general. He was in command of the combined English and French forces in the victorious campaign of 1860 against China, and received the title of Count of Palikao (a place east of Peking) from the Emperor Napoleon after the fall of Peking. He obtained rich booty for himself in the plunder of the Imperial summer palace. In August, 1870, on the resignation of the Ollivier Ministry, immediately after the first reverses of the French, he was charged by Napoleon with the formation of a new Ministry. He himself took charge of the nation's defenses, and in twenty-four days placed 140,000 men in the field, besides arming the capital. After the defeat at Sedan he quitted France and afterwards retired to private life. His book, *Un ministère de vingt-quatre jours* (1871), describes his experiences.

COUSIN PONS, kōō'zān' pōn. LE. A novel by Balzac (1847), describing the treatment of the poor relative who outstays his welcome.

COUSINS, kūz'nz. SAMUEL (1801-87). An English engraver, born in Exeter. He was made a member of the Royal Academy in 1835, a member of the School of Engraving in 1854, and professor at the Royal Academy in 1855. He engraved innumerable portraits after Reynolds, Lawrence, and Gainsborough, and pictures from the originals of Wilkie, Landseer, and others.

COUSSEMAKER, kōōs'má'kār'. CHARLES EDMOND HENRI DE (1805-76). A French historian of music, born at Bailleul (Nord). After studying at the Donai Lycée, he completed his musical education under Moreau and Lefebvre. He devoted himself principally to researches on mediæval music, on which subject he published the following important works: *Mémoire sur Hucbald* (1841); *Histoire de l'harmonie au moyen-âge* (1852); *Drames liturgiques du moyen-âge* (1861); *Les harmonistes des XIII^e et XIV^e siècles* (1864); *Les harmonistes du XIV^e siècle* (1869); and *Scriptores de Musica Medii Ævi* (1866-75), his principal work.

COUSTOU, koo'stoo', NICOLAS (1658-1733). A French sculptor, born at Lyons, the son of a wood-carver, from whom he received his first instruction. He studied in Rome from 1683 to 1686, and settled in Paris, where he became rector of the Academy in 1720. Among his works, many of which were destroyed during the Revolution, are the marble groups, "Union of the Seine and the Marne," "Huntsman Resting," "Daphne Pursued by Apollo," all now in the Garden of the Tuileries; statues of Julius Cæsar and of Louis XV., in the Louvre; and "Descent from the Cross," in the choir of Notre Dame, one of his best efforts.

COUTANCES, koo'tain's. A town in the Department of La Manche, France, at the confluence of the Soulle and Bulsard, 57½ miles south of Cherbourg by rail (Map: France, E 2). It is built on a conical hill a few miles from the English Channel, and is a picturesque old city. It is the seat of a bishopric, and its cathedral is one of the finest specimens of ecclesiastical architecture in the early Pointed style of Normandy. Other noteworthy features are the Gothic Church of Saint Peter's, the public gardens and museum, and the ruins of an ancient aqueduct. Coutances has manufactures of muslins, lace, yarns, pianos and organs, etc., and a trade in grain. Population, in 1891, 8145; in 1901, 6991. The town is the Constantia of the Romans. For a history and description, consult *Annuaire-guide de Coutances* (Coutances, 1897).

COUTHON, koo'ton', GEORGES (1756-94). A French politician and revolutionary leader, born at Orsay, in Auvergne, December 22, 1756. He practiced law successfully at Clermont, where he acquired great popularity on account of his fine intellectual powers and grave gentleness of character. At first a moderate republican, he was elected to municipal office and later, in 1791, was sent by the electors of Puy-de-Dôme to represent them in the Legislative Assembly. He became more and more radical with the progress of the Revolution, and, though a chronic invalid, he poured forth invectives against royalty and the Church from the tribune. He voted for the death of the French monarch without delay or appeal to the country. Elected to the Convention, Couthon attached himself to Robespierre, was appointed a member of the Committee of Public Safety in 1793, and sent against the insurgent city of Lyons. After the entrance of the Republican army Couthon showed comparative moderation and controlled the soldiery. Only twenty-four of the insurgents were put to death, and though property was ruthlessly destroyed, the lives of the citizens were respected until the arrival of Collot d'Herbois (q.v.). Couthon returned to Paris, formed with Robespierre and Saint Just a supreme tribunal, and made himself conspicuous by his extreme virulence against England. He assisted Robespierre in destroying the partisans of Hébert and Danton, but was himself involved in the ruin which overtook his chief. After a vain attempt at suicide Couthon was borne to the guillotine, July 28, 1794, together with Saint Just and Robespierre. Consult: Mège, *Correspondance de Couthon* (Paris, 1872); Aulard, *Les orateurs de la législative et de la convention* (Paris, 1885-86); Morse-Stephens, *The French Revolution* (New York, 1891).

COUTRAS, koo'tra'. A town in the Department of Gironde, France, on the left bank of the Dronne, 26 miles northeast of Bordeaux. Coutras has a trade in flour, and the district produces red wine. The place is noteworthy on account of the bloody victory gained here in 1587 by Henry of Navarre over the forces of the Catholic League. In this battle the Duc de Joyeuse, commander of the Leaguers, was slain, as well as many other great noblemen on the same side. Population, in 1891, 4231; in 1901, 4062.

COUTTS, koots. See BURDETT-COUTTS.

COUTURE, koo'tur', THOMAS (1815-79). A French painter, born at Senlis, December 21, 1815. He studied under Gros, and after that master's death under Delaroche, without being a follower of either. In 1837 he obtained the Prix de Rome, and in 1845 his picture "The Thirst for Gold" brought him a wide reputation. His "Romans of the Decadence" obtained a first-class medal, and is now in the Louvre. Among his other works are the "Falconer" (1855) and "Damocles" (1872). Under Napoleon III. he became Court painter, but he was not enough of a courtier to please the Emperor, and resigned his position. In 1869 he retired to his estate, Villiers-le-Bel, near Paris, where he died on March 27, 1879. He was neglected in France, but his pictures were purchased by foreigners, especially by Americans. During his last period he painted many portraits, of which there are frequent examples in the museums of southern France. His art grew more symbolical with advancing life. Many of his works, particularly his sketches, are preserved in the Barbiedienne collection in Paris. Consult: Healey, "Couture," in Van Dyke's *Modern French Masters* (New York, 1896); Claretie, *Peintres et sculpteurs contemporains* (Paris, 1873).

COUVADE, koo'vad' (Fr., a brooding, from *couver*, to hatch, from Lat. *cubare*, to lie down). A custom of certain primitive peoples in accordance with which the father of a new-born babe adopts the rôle of invalid while the mother goes about her ordinary occupations. The custom was well developed on both hemispheres. On the authority of Strabo and later writers it was ascribed to the Basques of Europe, a theory which has been much discussed; Tylor regarded it as a survival of a supposed matriarchate into patriarchal society; while Ripley is skeptical as to the present existence of the custom among the Basques. Traces of it are found in Asia and in North America; and it has been well observed in South America by Rodway (*In the Guiana Forest*, 1895). The custom would appear to mark one of the most important steps in human progress, i.e. the transition from maternal organization to paternal organization. Recent researches tend to show that in all primitive society kinship is traced in the maternal line, because paternity is not recognized; that in this stage of civilization the tribal government is avuncular or adelphiarcal rather than matriarcal; and that the recognition of paternity first prepares the way for tracing paternal kinship and its responsibilities, which are sometimes exaggerated ceremonially into such observances as that of the couvade. Consult further: Ripley, *The Races of Europe* (1899); McGee, *The Seri Indians* (17th Rep. Bur. Am. Ethnology); Deniker, *The Races of Man* (1900); Keane, *Ethnol-*

ogy (1896); Ploss, *Das Weib* (1897); etc. See MAN, SCIENCE OF.

COUXIA, kōō'shē-á, or **COUXIO**, kōō'shē-ó. A South American monkey. See SAKI.

COVA'RIANTS. See FORMS.

COVE (AS. *cofa*, chamber, Teel. *kofi*, hut, MHG. *köbe*, Ger. *Koben*, stall). In architecture, a long concave surface usually connecting two planes at right angles, as in coved ceilings; or the surface beneath a projecting story or balcony. The large coves of Italian and French late Renaissance palaces were often elaborately decorated with frescoes and reliefs.

COVENANT (OF. *covenant*, Fr. *covenant*, It. *convenente*, from Lat. *convenire*, to agree, from *com-*, together + *venire*, to come). A term much used in theology in close connection with the Hebrew *berith* of the Old Testament and the Greek *diathēkē* of the New. God is represented as making successively, with Adam, Noah, Abraham, and all Israel, covenants, which are substantially the same covenant, under which Israel is adopted as God's special and chosen people, and is bound to Him in close and mutual obligations. The covenants of the Old Testament are all substantially 'covenants of works,' putting blessing upon the basis of obedience; the one covenant of the New Testament, which replaces the others, conditions blessing upon faith in Jesus Christ. This simple idea was built out and systematized into the Federal Theology during the constructive Protestant period (by Coecejus, 1603-69), and was incorporated in the Westminster Confession. See FEDERAL THEOL-OGY.

COVENANT. In English law, a contract by deed or specialty, that is, one in which the validity of the promise does not depend upon consideration (q.v.) as in the case of simple contracts, but upon the formality of execution of the contract by sealing and delivery. The essential characteristic of covenants distinguishing them from other specialties is the promise. Thus a bond differs from a covenant only in that it is a mere acknowledgment of indebtedness without an express promise to pay the amount of the bond.

The term covenant is also used in a narrower sense to indicate the promise or stipulation contained in a specialty or deed which is incidental to its main purpose, as, for example, the covenants of warranty contained in a deed of conveyance. Although consideration was not required to render a covenant valid and enforceable at law, courts of equity deemed the seal to be presumptive evidence of consideration only, and would not compel the covenantor to perform his promise if it appeared that no consideration was given for it. This is probably the effect of modern statutes, providing that the seal on sealed instruments is only presumptive evidence of consideration.

In general, covenants, from their nature, are required to be expressed in the instrument by which they are created, but in certain exceptional cases they are implied from the character of the instrument itself, as for example the covenants implied in a lease (q.v.).

At common law, the form of action used to recover damages for breach of covenant was also known as covenant. Under modern codes of procedure and practice acts, the action of covenant

has become obsolete, the same office being performed by the various statutory forms of contract action. Covenants contained in the same instrument are said to be *mutual*, *concurrent*, or *dependent*. The covenants in an instrument are said to be *mutual* when performance by each of the parties entering into the covenant is a condition of performance by the other, so that no action for breach of covenant will lie unless the party suing has tendered the performance of his covenant before bringing his action. An *independent covenant* is one which must be performed by the covenantor, irrespective of the performance of the covenantee's covenant in the same instrument.

Real covenants, or covenants which at early common law bound the covenantor's heirs to the extent to which they inherited real estate, are now of slight importance, since all of the property of a deceased person may be subjected to the payment of his debts. See ADMINISTRATION.

Covenants which run with the land is a term that embraces a special class of real covenants which relate to the use of real estate or require the covenantor to do something with reference to it. Their peculiarity is that any subsequent transferee of the real estate is entitled to the benefit of the covenant, and may sue upon it, and that, in certain exceptional instances, when the covenant imposes a burden upon the owner of the real estate, the liability to perform the covenant passes to the transferee of the real estate. This is anomalous. See ASSIGNMENT; EASEMENT.

Covenants for title, or *covenants of warranty*, are particular forms of covenants which run with the land, and are made by the grantor in a deed or instrument conveying real estate. The usual covenants of warranty are: "The covenant of seisin (i.e. that the grantor is seized of the estate which he undertakes to convey); the covenant that the grantor has the right to convey; the covenant for quiet enjoyment (i.e. that the grantor will not interfere with the use or enjoyment of the real estate by his grantee); the covenant for further assurance (i.e. that the grantor will make any further necessary conveyance to perfect his grantee's title); and the covenant of warranty, which binds the covenantee to warrant and defend the title against any one claiming under paramount title or interest in the real estate conveyed.

Formerly the effect of these covenants was to require the covenantor or his heirs to give the grantee other lands in case the title proved to be defective. In modern practice the effect of breach of any covenant for title is to entitle the covenantee or his grantee to recover damages. Covenants for title, however, are not deemed to be broken until the grantee is actually disturbed in his possession. An important effect of covenants for title is to estop the grantor, and all claiming under or through him, from claiming any interest in the title which he has warranted, thus conferring upon his grantee a title by estoppel, as it is said. See ESTOPPEL; WARRANTY.

Covenants to stand seized, formerly of great importance, were covenants by the owner of real estate to hold it to the use of, or in trust for, a relative. This covenant is of little importance in modern law. See USES; TRUST.

The terms 'affirmative,' 'negative,' 'joint,' and 'several' are applied to covenants, but are with-

out peculiar significance in this connection. Consult: Sims, *Treatise on Covenants* (Chicago, 1901); Rawle, *Treatise on the Law of Covenants for Title* (5th ed., Boston, 1887). See BOND; CONTRACT; SPECIALTY; RESTRAINT OF TRADE; etc.; and consult the authorities there referred to.

COVENANTERS. See COVENANTS, TIE; and PRESBYTERIANISM.

COVENANTS, TIE. A term by which the Scottish people denoted association of 'bands' under oath to support each other in times of danger, or to maintain some principle. The most famous ones are the *National Covenant* of 1638, and the *Solemn League and Covenant* of 1643, which are often referred to simply as the Covenant, though they should be clearly distinguished. The *National Covenant* was an agreement signed by all classes in Scotland to resist by force the introduction into Scotland by Charles I. of a modified form of the English *Book of Common Prayer*, and a new body of canons increasing the nominal power of the Scottish bishops. The nobles disliked the increased power of the bishops because they were beginning to look upon them as rivals, and because they feared that Charles would proceed to a recovery of the Church lands; while the commons disliked the Prayer Book, not only because it was English, but also because they looked upon it as a popish innovation. The Covenant was based upon a previous one of 1580, whose object was to maintain the Scottish Presbyterian Church against a Catholic conspiracy, but it added numerous citations of Parliamentary acts bearing upon the subject of religion, and a mutual oath "to labor by all means lawful to recover the purity and liberty of the gospel as it was established and professed before the aforesaid innovations." It became the basis of the Scotch resistance to the King, which culminated in the two Bishops' wars and the termination of Charles's arbitrary rule.

The *Solemn League and Covenant* was an agreement between the English and Scottish Parliaments by which the Scotch came with an army to the assistance of the English Parliament in the war against Charles I., on condition that Presbyterianism should be introduced into England and Ireland. The Parliament accepted the condition somewhat unwillingly, but in view of the Royalist successes in 1643, Scotch aid seemed indispensable. The Covenant was generally signed by the members of the House of Commons and the Assembly of Divines. It was imposed by ordinance upon all persons over eighteen years of age, upon members of the universities, and upon officers and soldiers of the New Model, although the ordinances could not be strictly enforced. It was not only the bond of union between England and Scotland during the war, but was used as a test against the rising Independents, and, as such, encountered lively opposition. The signers took oath to labor for "the preservation of the reformed religion in the Church of Scotland, in doctrine, worship, discipline, and government, . . . the reformation of religion in the kingdoms of England and Ireland, in doctrine, worship, discipline, and government, according to the Word of God, and the example of the best reformed churches," and to endeavor "to bring the churches of God in the three kingdoms to the nearest conjunction and uniformity in religion, confession of faith, form of Church government, direction for worship, and

catechising." Both covenants were abolished at the Restoration, and their adherents severely persecuted. They are printed in Gardiner, *Constitutional Documents of the Puritan Revolution* (London, 1897). Consult, also: Gardiner, *History of England* (London, 1883-84); and id., *Great Civil War*, vol. i. (London, 1886). See PRESBYTERIANISM.

COVENT (kūv'ént) **GARDEN** (properly *Convent Garden*, from having been originally the garden of Westminster Abbey). A square in London, celebrated for its history and for its great market of fruit, vegetables, and flowers. As the kitchen garden of the Westminster monks it was a walled inclosure, which extended from the Strand to Longacre. It came, as a Crown gift, into the possession of the Bedford family in 1552. The square was laid out by Inigo Jones in 1632, and the ancient garden was perpetuated by the continued sale of vegetables. (See COVENT GARDEN MARKET.) In the seventeenth century the neighborhood of Covent Garden was a very fashionable quarter of the town, and frequent allusions are made to the place in plays of Charles II.'s time. It has artistic associations of Marvell, Dryden, Fielding, Steele, Otway, Foote, Garrick, Hogarth, De Quincey, Charles and Mary Lamb, Turner, and other celebrities.

COVENT GARDEN JOURNAL. A short-lived bi-weekly periodical first issued in January, 1752, by Henry Fielding, under the name of 'Sir Alexander Drawensir, Knight of the Censor of Great Britain.' It soon involved Fielding in literary quarrels.

COVENT GARDEN MARKET. A great London vegetable, fruit, and flower market, established in the first half of the seventeenth century by small gardeners from the suburbs. In 1829 the rough sheds were succeeded by a market house, covering about three acres of ground, from designs by Mr. Fowler. In 1859 a flower-market, covered with glass, was built on the south side of the Opera House.

COVENT GARDEN THEATRE. A famous London theatre on Bow Street, the home of grand opera. It was built in 1731 by the harlequin Rich, under a patent from Charles II. to Sir William Davenant, 1662. It has been several times rebuilt. It was burned in 1808, and rebuilt in 1809 at great cost. The increased prices of admission, intended to defray part of the expenses, gave rise to the Old Price Riots. In 1847 it was called the Royal Italian Opera House. On March 4, 1856, it was burned again, and the present structure was erected in 1858.

COVENTRY, kūv'cu-trī (OE. *Coventre*, AS. *cofatrēo*, cove-tree, from *cofa*, cove + *trēo*, tree, or tree of Cofa; popularly etymologized as Convent Town, from the convent established there by Leofrie). A manufacturing city, Parliamentary and municipal borough in Warwickshire, England, on the Sherbourne, 18½ miles east-southeast of Birmingham (Map: England, E 4). It stands on a gentle eminence in a valley, with a ridge of hills on the south, and contains many old houses with timbered fronts projecting into narrow streets, and belonging to the fifteenth and sixteenth centuries. The modern part of Coventry, however, is well, though not regularly, built. Its most interesting public buildings are the three churches composing the 'three tall spires' of Coventry; Saint Michael's, built of red sandstone

in the Perpendicular style, about the fourteenth century, is said to be the largest parish church in England; Trinity Church, another Perpendicular structure, has a spire over 230 feet high; the third of the spires is that of the old Grey Friars' church. Saint Mary's Guildhall, built in 1450, for the united guilds, is one of the finest examples of ornamental architecture in England. Its great hall has a finely carved oaken roof and stained glass window, and is hung with ancient tapestries. The rapid industrial growth of Coventry is responsible for the recent extension of its boundaries and the widening of many of the old streets. The municipality owns its water-supply, on which it nets a substantial annual profit. It also supplies gas and electricity, and maintains public baths, libraries, a technical institute, markets, crematory, and cemeteries. The city has an excellent modern sewerage system, with which is connected a sewage farm. The chief manufactures are ribbons, watches, fringes, etc., and especially bicycles and tricycles, which are said to have been first made here. Coventry is in railway communication with all parts of England. The town sends one member to Parliament. Population, in 1891, 58,500; in 1901, 69,900.

HISTORY. Coventry is a very ancient place. In 1044 Earl Leofric and his wife, Lady Godiva, founded here a magnificent Benedictine monastery. For many years the traditional deed of Godiva (q.v.) was celebrated by a procession. In 1344 the town was incorporated. In the fifteenth century religious mysteries or plays were often acted here by the members of the various guilds before kings. Henry VIII. demolished the beautiful cathedral of Coventry, as well as the ancient walls which formerly surrounded it. Here occurred the famous meeting for the intended trial by battle between the Dukes of Norfolk and Hereford, immortalized in Shakespeare's *Richard II.* Two memorable Parliaments were held in the monastery of Coventry in the fifteenth century. The one contained no lawyers, while the other passed many attainders against the Duke of York, etc. In the fifteenth and sixteenth and seventeenth centuries Coventry was famous for woollens, broadcloths, caps, and blue thread bonnets. Consult: Fretton, "Antiquarian Losses in Coventry," in *Archæological Journal*, vol. xxxvi. (London, 1880); Dormer, *History of Coventry* (New York, 1898).

COVENTRY. A town in Kent County, R. I., 13 miles southwest of Providence; on the Pawtuxet River, and on the New York, New Haven and Hartford Railroad (Map: Rhode Island, B 3). The main industries are agriculture and the manufacture of cotton and woolen goods. The government is administered by town meetings. Coventry, taken from Warwick, and incorporated in 1741, was the home of Gen. Nathanael Greene (q.v.) after 1770. Population, in 1890, 5068; in 1900, 5279.

COVENTRY PLAYS. A set of forty-two plays, combining the 'Morality' and the 'Mystery,' acted during the sixteenth century at Coventry or thereabouts on *Corpus Christi* Day and probably written by the clergy. They were extremely popular and widely attended. The following reference is made to them by the elder Heywood:

"Thys devyll and I were of olde acquaintance,
For oft in the play of Corpus Christi
He hath played the devyll at Coventry."

For further information, consult Morley, *English Writers*, iv. (London, 1887, et seq.).

COVERDALE, MILES (1488-1568). An English Bible translator. He was born at Coverdale, in Yorkshire, was educated at Cambridge, was ordained in 1514 at Norwich, and became the same year an Augustinian at Cambridge. By 1526, however, his religious opinions had so far changed that he left his convent and devoted himself earnestly to the work of the Reformation. Dressed like a secular priest, he preached against confession and image-worship. Shortly after that he went abroad. In 1535 he brought out his first translation of the Bible 'out of Douche (German) and Latyn into Englishe,' with a dedication by himself to Henry VIII. This was the first complete translation of the Bible printed in the English language. The Psalms of this translation are those still used in the Book of Common Prayer. The vexed question as to the printer of the volume has been settled, probably, by recent discoveries in favor of Christopher Froeschouer, the famous Zurich printer. It also seems probable that Jacob Van Meteren, the Antwerp printer, employed Coverdale to make the translation, which was done in Antwerp. The basis was the Zurich Swiss-German Bible and Tyndale's New Testament, along with the Vulgate. It was reprinted in London in 1537, with the royal license. In 1538 Coverdale, with the consent of King Henry VIII., and with the permission of Francis I., went to Paris to superintend another English edition of the Scriptures, his reason for going to Paris being that paper and workmanship were there cheaper and better than in England. The Inquisition, however, notwithstanding the royal license of Francis, interfered, seized the whole impression, consisting of 2500 copies, and condemned them to the flames. But through the cupidity of one of their executive officers, who sold a considerable number of the heretical books to a haberdasher as waste paper, some copies were saved and brought to London, along with the presses, types, etc., which had been employed in printing them. Several of the workmen also came over to London: and Grafton and Whitchurch, the noted printers of that day, were thus enabled to bring out in 1539, under Coverdale's superintendence, the "Great Bible," as it is called on account of its size. Coverdale also in 1540 edited a second edition, commonly called Cramer's Bible, because that prelate wrote a preface to it. From 1540 to 1548 Coverdale was on the Continent. He married in the former year. On his return he became a royal chaplain, and in 1551 was appointed to the see of Exeter, the duties of which office he discharged with great zeal, until the accession of Mary in 1553, when he was ejected and thrown into prison, from which he was only released after a year's confinement, on the earnest intercession of the King of Denmark, whose interest was evoked by his chaplain, Coverdale's brother-in-law, and on the condition that he should leave the country. Coverdale went to Denmark, and subsequently to Westphalia, Deux Ponts, and Geneva. In 1559, after the accession of Elizabeth, he returned to England, but certain notions concerning ecclesiastical ceremonies, imbibed at Geneva, operated against his restoration to the see of Exeter, and his appointment as Bishop of Llandaff. In 1564 he was collated to the rectory of Saint Magnus, London, but, owing to age and infirmities, he resigned

it in 1566, and died about two years afterwards. He was buried February 19, 1568. Coverdale was the author of several tracts designed to promote the Reformation, and made various translations from the works of the Continental Reformers. His works and letters were published with a memoir, by the Parker Society (Cambridge, 1844-46). Consult, also: *Memorials of Myles Coverdale* (London, 1838); F. Fry, *The Bible by Coverdale* (London, 1867).

COVERED WAY, or **COVERT WAY**. A term used in fortification to describe a passage constructed on the side of the ditch toward the enemy. See **FORTIFICATION**.

COVERLY, kŭv'ŕ-li. **SIR ROGER DE**. An old English dance, so called from the tune used during its performance. Neither the author of the tune nor the date of its composition is known, but the editor of the Skene MS. claims the tune as Scotch, on the authority of a MS. dated 1706, and says that north of the Tweed it is known as the "Mautman comes on Monday." The tune is variously called "Old Roger of Coverly for evermore, a Lancashire Hornpipe;" "Roger of Coverly;" "Roger a Coverly," in Gay's opera *Polly*; "Roger de Coverly," in *Robin Hood*; and "Sir Roger de Coverly," in Fielding's *Tom Jones*. A song, "O Brave Roger de Coverly," is contained in *Pills to Purge Melancholy*. The dance is an old-fashioned country-dance (or contredanse), and is known in the United States as the "Virginia reel." Addison took the name for his Sir Roger de Coverley in the *Spectator*.

COVERSED (kŏ-vĕrst') **SINE**. See **TRIGONOMETRY**.

COVERTURE (OF. *coverture*, Fr. *couverture*, covering, from ML. *coaptura*, from Lat. *coopere*, to cover, from *co*, together + *operire*, to cover, for *operire*, Lith. *uch-veriù*, I shut). Under the common law, the legal condition or status of a married woman. By that law, an unmarried woman, whether spinster or widow, is a 'complete juristic person,' having the same standing before the law as a man. Upon marrying, however, i. e. coming under the protection of a man, her legal position is radically altered, and, in many respects, completely merged in that of her husband. This is especially true of her property rights. Her goods and chattels at once become his property. He acquires custody of her claims against others (*choses in action*), and may collect them for his own benefit. Her land passes under his control, and he acquires a joint seisin with her therein and may take the rents and profits to his own use during the continuance of the marriage relation. On the other hand, he becomes liable to pay her debts, those contracted before as well as those contracted after marriage, and under some circumstances he is responsible for her torts and crimes. The modern legislation which has almost restored to the married woman her lost personality will be described under the titles **HUSBAND AND WIFE** and **MARRIED WOMAN**. Consult the authorities referred to under these titles, and also those under **COMMON LAW**.

COVIELLE, kŏ'vyĕl'. In Molière's *Le bourgeois gentilhomme*, Cléonte's valet, whose wit brings about the marriage of Cléonte and Lucille.

COVIELLO, kŏ'vyĕl'ŏ. The clown of old Italian popular comedy.

COVILHÃO, kŏ'velyoun'. A town of Portugal, in the Province of Beira, situated on the southeastern slope of the Serra da Estrella at an altitude of 2180 feet (Map: Portugal, B 2). It is commanded by a castle, and is one of the chief centres of cloth manufacturing in Portugal. Population, in 1890, 17,562; in 1900, 15,527.

COVILLE, FREDERICK VERNON (1867—). An American botanist, born at Preston, N. Y. He received his education at Cornell University and was instructor in botany there from 1887 to 1888. In the latter year he became connected with the United States Department of Agriculture, and after serving five years as assistant in botany, was made curator of the United States National Herbarium. In 1899 he was elected president of the Biological Society of Washington. His publications include a monograph on the *Botany of the Death Valley Expedition* (1893), the author having taken part in the expedition during 1890-91. He also prepared a number of valuable reports.

COVINGTON, kŭv'ing-ton. A city and the county-seat of Newton County, Ga., 40 miles east-southeast of Atlanta; on the Georgia and the Central of Georgia railroads (Map: Georgia, C 2). It contains a female college, and is the commercial centre of a cotton-growing and dairying region. Population, in 1890, 1823; in 1900, 2062.

COVINGTON. A city and the county-seat of Fountain County, Ind., 70 miles west by north of Indianapolis; on the Wabash River, and on the Wabash, the Cleveland, Cincinnati, Chicago and Saint Louis, and other railroads (Map: Indiana, B 2). Population, in 1890, 1891; in 1900, 2213.

COVINGTON. A city and the county-seat of Kenton County, Ky., at the junction of the Ohio and Licking rivers, opposite Cincinnati, of which it is practically a suburb (Map: Kentucky, G 1). It is entered by the Louisville and Nashville, the Kentucky Central, and the Chesapeake and Ohio railroads, and electric railroads also connect it with the neighboring towns. Bridges to Cincinnati and to Newport, Ky., add to the facilities for communication, the great suspension bridge to the former city being a noteworthy specimen of engineering. (See **CINCINNATI**.) Covington occupies an area of about two and one-third square miles on a beautiful plain partly surrounded by hills, and resembles Cincinnati in its general arrangement. Of a total street mileage of about 45 miles, more than three-fourths are paved, the great part with macadam and asphalt. The city has many handsome private residences, a public library, city hall, and a Federal building noteworthy as a specimen of modern Gothic; and among charitable institutions, a hospital for contagious diseases, a German orphan asylum, and a home for aged men and women. Covington is a prominent centre of Roman Catholic influence, the cathedral, a type of flamboyant Gothic, being one of the finest ecclesiastical structures in the State. Connected with this denomination there are also a Benedictine priory, a convent, a hospital and founding asylum, and Notre Dame Academy. The facilities for transportation, both by rail and by water, placing the city in communication with a wide territory possessing valuable natural advantages, have contributed to the commercial

importance of Covington, though it is overshadowed by its greater neighbor. Its industrial interests also are important, and include extensive pork-packing establishments, rolling-mills, glass-factories, distilleries, tanneries, tobacco-factories, cotton-factory, and manufactures of vinegar, furniture, stoves, tinware, bricks, tile, pottery, rope, cordage, etc. There are municipal water-works, built in 1869 at a total cost of about \$1,200,000, the entire system now including some 45 miles of mains, and furnishing an abundant supply of water drawn from the Ohio River at a distance of about 13 miles above the city. Covington's annual budget approximates \$465,000, the main items of expense being \$90,000 for schools, \$85,000 for interest on debt, \$35,000 for police department, \$35,000 for the fire department, \$30,000 for street expenditures, \$30,000 for the water-works, and \$20,000 for charitable institutions. Settled in 1812 and laid out three years later, Covington was chartered as a city in 1834. Population, in 1860, 16,471; in 1880, 29,720; in 1890, 37,371; in 1900, 42,938.

COVINGTON. A town and the county-seat of Tipton County, Tenn., 37 miles northeast of Memphis; on the Illinois Central Railroad (Map: Tennessee, B 5). It is the shipping point for the cotton and other products of a fertile region, and has also flour and saw mills, cotton and cottonseed-oil mills, cotton-compress, etc. Population, in 1890, 1067; in 1900, 2787.

COVODE, JOHN (1808-71). An American legislator, born in Westmoreland County, Pa. He worked for several years on a farm; was apprenticed to a blacksmith; and afterwards attained considerable wealth as a woolen manufacturer. He served for two terms in the Pennsylvania Legislature, and was a member of Congress, first as an Anti-Masonic Whig and then as a Republican, from 1855 to 1863, and again from 1868 to 1870. In politics he was prominent as a supporter of Lincoln and as an opponent of Johnson, but is chiefly remembered for his connection as chairman with the special Congressional committee appointed in 1860 to investigate the charges brought against President Buchanan. See COVODE INVESTIGATION.

COVODE INVESTIGATION. An investigation (1860) by a Congressional committee of five, headed by Covode of Pennsylvania, into the charge made by two anti-Lecompton Democrats that the Administration had endeavored to persuade them corruptly to support the Lecompton Bill. (See LECOMPTON CONSTITUTION.) President Buchanan vigorously protested against the appointment of a committee for such a purpose, on the ground that it would detract from the dignity and independence of the executive office, but his protests were unheeded, and in June the committee made its report, the Republican majority supporting the charge and the Democratic minority denouncing it. The committee, however, was considered to have brought forward sufficient evidence to prove Buchanan's favoritism and his questionable use of patronage. The report was printed in a bulky volume. For a defense of Buchanan, consult Curtis, *Life of Buchanan* (New York, 1883).

COW. See CATTLE; DAIRYING.

COWAGE, COWHAGE, or COWITCH (from Hind. *Kawānch*, *Kōānch*). Short, slender,

brittle hairs, which grow on the outside of the pods of plants of the genus *Mucuna*, natives of the tropical parts of America and Asia. The genus belongs to the natural order Leguminosae and has a knotted, two-valved pod, divided by transverse partitions. The species are twining plants, shrubby or herbaceous, with leaves of three leaflets. That which yields most of the cowage brought to market is *Mucuna pruriens*, a native of the East Indies, with racemes of fine purple flowers, which have a disagreeable alliaceous smell, and pods about 4 inches long. *Mucuna urens*, the ox-eye bean of the West Indies, yields cowage of similar quality. The hairs readily stick in the skin, and cause intolerable itching. Cowage is sometimes used in medicine, acting mechanically in killing and expelling worms, particularly the species of *Ascaris* (q.v.). That it does not act on the inner surface of the intestinal canal is supposed to be owing to the mucous secretion. It is generally administered in syrup or honey. Before the pods of cowage-plants are ripe, they are used as a vegetable, like kidney beans, and are very palatable. *Mucuna nitilis*, velvet bean, is by some considered specifically the same as *Mucuna pruriens*, but velvet-bean pods are without the stinging hair of the other. The velvet bean has lately attracted much attention as a forage crop. It is well adapted to Florida and the Gulf States, having about the same value as the better varieties of cow-peas. As a green manure and mulch crop for orchards it is highly considered.

COW BAY. A seaport on an inlet of the same name in the northeast of Cape Breton Isle, Nova Scotia, Canada, 22 miles east of Sydney (Map: Nova Scotia, K 3). A Government breakwater and quay 1800 feet long protect the inlet. Bituminous-coal mines are worked in the vicinity. Estimated population, in 1901, 3000.

COWBIRD. A small North American blackbird (*Molothrus ater*) closely related to the redwing, remarkable for its parasitic habits, and frequenting in small flocks fields where cattle pasture, often alighting upon them to eat parasites, or clustering about their feet to snap up the insects disturbed by their movements; to this habit it owes its names, cow-blackbird, cowpen-bird or bunting, buffalo-bird, etc. This common species (see Plate of BLACKBIRDS) is about 8 inches long; the adult male is rich glossy black, with greenish reflections, except the head, which is chocolate-brown; the female and young are simply brownish-gray, paler beneath. The cowbird is found throughout the United States, from Texas northward nearly to Hudson Bay. In the north it is migratory, but south of the Ohio it is a permanent resident. It is to be seen in small bands frequenting fields and pastures, where its principal food is vegetable (mainly seeds of weeds), with insects caught upon the ground and about cattle. There are usually several more males than females in each band, for these birds do not pair; and the antics and spluttering and guttural squeaks with which the males try to attract the females are most queer and amusing. In the autumn they gather in large flocks and associate with other blackbirds. Two other species are found in the southwestern United States, a third and fourth in Mexico and Central America (of the allied genus *Colaptes*), and several in various parts of South America.

The *parasitism of the cowbirds* is their most striking characteristic, their behavior resembling that of the European cuckoo. None, except one, takes a mate, or makes a nest, or incubates its eggs. • Instead of this, when the breeding season (May and June) is at hand, the female ready to lay an egg quietly leaves the flock and stealthily seeks the home of some bird, from which the mother is temporarily absent, incubation not having begun. There she deposits her egg (see Colored Plate of Eggs of Song-Birds), to which she pays no more attention. It matters not whether the nest she visits has already its full supply of eggs, or even whether it already contains one or several eggs of her own species; she will sometimes throw out eggs of the owner to make room for her own. The egg of the cowbird usually hatches in less time than do the eggs of the bird on which it is imposed, whereupon the rightful eggs may be abandoned or thrown out; or, if some of them hatch, the young are speedily starved or smothered or elbowed out of the nest, while the foster-parents devote themselves to the care of the greedy stranger. He remains in the nest until it is really outgrown, but even after he has left it he is cared for, for a time, by the birds that brought him up. But at last, when well able to fly, he seeks out others of his own kind, and the birds that have devoted themselves to him so assiduously have nothing to reward their pains. Over 100 species of birds are thus burdened with more or less frequency; but some will desert the nest rather than incubate the strange egg; others build a second story on the nest, leaving the cowbird's egg to perish below, while they raise their own brood in the superstructure.

The egg of the cowbird is a rather blunt oval, measuring, on the average, .84 by .65 of an inch, and is white or grayish, profusely speckled with browns, the general effect of which is indistinct and pale; it is not easily mistaken for any other bird's egg of its size. Several species of cowbirds inhabit Central and South America, and have similar habits, except in one instance, the bay-winged cowbird (*Molothrus badius*) of Argentina and Bolivia, which differs from the ordinary type in several ways, among others in having a low and pleasing song, which it delivers more or less all the year around. It does not abandon its eggs to the care of other nurses, but forms conjugal ties and occasionally makes a nest of its own; more often, however, it seizes upon the nests of other birds, and in their despoiled property lays its eggs and rears its own young. A circumstantial history of this interesting group and a discussion of bird-parasitism may be found in Selater and Hudson, *Argentine Ornithology* (London, 1888-89), largely reprinted by Bendire, in "The Cowbirds," in *Report of the National Museum for 1893* (illustrated, Washington, 1895).

COWBOYS. (1) The name applied during the Revolutionary War to robbers, usually of cattle, sometimes of other property, who infested the roads east of the Hudson River between the British and American lines. They professed to be Tories. A similar band, professing to be Whigs, called 'Skinners,' plundered wayfarers at the same period and in the same places. See Cooper's romance *The Spy*.

(2) The name given to the mounted herdsmen hired by the owners of large herds of cat-

tle to look after their stock. In the great herding districts of the West, where cattle roam over vast areas without fences or roads, and with only scattered and irregular places for water and shelter, the cowboys occupy an important place. It is their business to keep the cattle together, to guide them to pasture, to prevent their being mixed with other droves, to protect them from Indian and other thieves, to brand them at the proper seasons, and to drive them to market when they are ready for slaughter.

COWELL, EDWARD BYLES (1826-1903). An English Sanskrit scholar. Born at Ipswich, he was educated at Oxford. He went to Calcutta in 1856, where he was professor of history in the Presidency College, and later principal of the Sanskrit College. In 1867 he was made professor of Sanskrit in the University of Cambridge. His contributions to advancing the knowledge of India were made not only through his writings, but also through the inspiration he gave to his pupils, whose numbers were large. His association with Edward FitzGerald of Omar Khayyam fame is of interest in English literary history. Among Cowell's more important works may be mentioned: *The Prākṛit Grammar of Vararuci* (2d ed. 1868); *The Black Yajur Veda*, books i. ii., in collaboration with Roer (1856-64); the *Kusumāñjali* (1864); *The Hindu Law* (1871); *The Hindu Digest* (1873); *The Aphorisms of Śāṅḍilya*, translated from the Sanskrit (1878); *The Sarva-darsāna-Saṅgraha*, translated from the Sanskrit, conjointly with Gough (1882); *The Buddha-Carita of Aśvaghoṣa*, in Sanskrit and English (1892-94).

COWEN, kou'en, FREDERIC HYMEN (1852—). An English musician, born at Kingstons, Jamaica. His parents took him to London when four years old, and while still a child he became a pupil of Benedict and Goss in that city. In 1865 he went to Leipzig, where he studied under Hauptmann, Moseheles, Reinecke, Richter, and Plaidd. In 1882 he became director of the Edinburgh Academy of Music, and in 1887 succeeded Sir Arthur Sullivan as conductor of the London Philharmonic. He was musical director of the Melbourne Centennial Exhibition (1888-89), and in 1896 was chosen conductor of the Liverpool Philharmonic and of the Manchester Concerts. His compositions include many songs, instrumental pieces, six symphonies, the operas *Pauline* (1876), *Thorgrim* (1890), *Signa* (1893), and *Harold, or the Norman Conquest* (1895), two oratorios, *The Deluge* (1878), and *Ruth* (1887), and a number of cantatas, of which the best known is *The Corsair* (1876).

COWES, kouz. A seaport and watering-place on the north coast of the Isle of Wight (Map: England, E 6). It consists of East and West Cowes, lying on opposite sides of the Medina. West Cowes is the more important of the two divisions, being the headquarters of the Royal Yacht Squadron, whose club has been located since 1856 in an old castle built by Henry VIII. Over two thousand of the pick of English sailors are employed as crews of the numerous yachts of the members. Several regattas are held annually, the principal in August, attracting crowds of visitors. Near East Cowes are several fine country seats, Whippingham Church, and Osborne House, the former royal seaside residence of Queen Victoria, now, with its grounds, a

public memorial and park, donated to the nation by Edward VII. Cowes is famous for its yacht-building yards, and has a considerable trade as the port of the island. Population, in 1891, 11,000; in 1901, 9000.

COWFISH (so named from the shape of its head). (1) A trunkfish (*Ostracium quadricorne*) of the tropical Atlantic, vari-colored in bright hues, and also called cinkold. (See **COWPILOT** and **PLATE OF PLECTOGNATH FISHES**.) (2) A grampus. (3) A cow-shark (q.v.).

COWGATE, THE. A well-known street in the Old Town, Edinburgh. It was once a fashionable place of residence, but is now given over to the poorer classes.

COWHAGE. See **COWAGE**.

COWHEEN. The local name in eastern Canada of the long-tailed duck (*Clangula hyemalis*), or old-squaw (q.v.).

COWITCH. See **COWAGE**.

COWL (AS. *cūle*, *cūhle*, *cugle*, Icel. *kúfl*, OHG. *cuglā*, Ger. *Kugel*, *Kogel*, OF. *coule*, It. *cuculla*, *cocolla*, from Lat. *cucullus*, cap). A hood generally attached to a loose cloak and worn on the head. It was common in England in the Middle Ages, but has come to be used chiefly by monks or members of some religious order, such as the Benedictines and Franciscans. See **COSTUME**, **ECCLESIASTICAL**.

COWLES, kōlz. WILLIAM LYMAN (1856—). An American scholar and educator, born at Belchertown, Mass. He graduated at Amherst College in 1878, was instructor in Latin there from 1880 to 1883, in 1883-84 studied at the universities of Berlin, Göttingen, and Leipzig, and in 1884 became associate-professor of Latin at Amherst. In 1894 he was appointed to a full professorship. From 1886 to 1894 he was lecturer in Latin literature at Smith College, where he was also acting professor of Latin in 1899-1900. He was elected a member of the American Philological Association and of the managing committee of the American School of Classical Studies at Rome, and in the study of classical archaeology has traveled extensively throughout the Italian peninsula. His publications include, besides many articles for periodicals, an excellent annotated edition of the *Adelphi* of Terence (1896; in Peck and Pease's Students' Series of Latin Classics), and *Selections from Catullus* (1900; with notes).

COWLEY, kou'li, ABRAHAM (1618-67). An English poet and essayist. He was born in London, and was educated at Westminster School and Trinity College, Cambridge. According to his own statement, he received his poetical inspiration from Spenser's *Faerie Queene*, a copy of which lay in his mother's parlor. A volume of poems, entitled *Poetical Blossoms*, was published by him at the age of fifteen, and one of the pieces contained therein was written when he was only ten years old. At Cambridge he obtained distinction for the elegance of his translations; and while there he composed the greater part of the *Davidis*, an epic in four books on the life of David—a work which he never completed. He was attached to the Court party, and, in consequence, was ejected from his college in 1643, after he had taken his degree of M.A. In 1646 he followed the Queen to Paris, where he remained ten years; and on his return to England,

being under suspicion, he was seized and bound in heavy securities for his future behavior. In the same year (1656) he published an important collection of his poems, including his elegies on Harvey and Crashaw, Pindaric odes, *The Mistress*, and the *Davidis*. He now studied medicine, receiving his degree the following year. After the Restoration he obtained a lease of the Queen's lands at Chertsey, in Surrey, whither he retired in 1665. He was buried in Westminster Abbey, near Chaucer and Spenser. Cowley belongs to what Dr. Johnson called the 'metaphysical' school of poets. He abounds in subtleties of thought and expression, enjoyed in his own day, but long since out of fashion. To us his fanciful love poems, displaying no emotion, seem very strange. Of his longer poems, the elegies cited above are the best. His most natural verse is scattered through his essays, which are graceful and beautiful. Consult: Johnson's essay in *Lives of the Poets*; and *Complete Works*, ed. Grosart (Blackburn, 1880-81).

COWLEY, HANNAH (1743-1809). An English poet and playwright. She was born at Tiverton, Devonshire, where her father, Philip Parkhouse, was a bookseller. It was not until several years after her marriage to Mr. Cowley, a captain in the East Indian service, that she began to write plays. Her first production, *The Runaways*, she wrote in less than a fortnight. It was presented by Garrick at the Drury Lane (May 10, 1779), and was instantly successful. Her other comedies include: *Who's the Dupe?* (Drury Lane, 1779); *The Belle's Stratagem*, which is still popular (Covent Garden, 1780); *Which Is the Man?* (Covent Garden, 1782); and *More Ways than One* (Covent Garden, 1783).

COWLEY, HENRY RICHARD CHARLES WELLESLEY, first Earl (1804-84). An English diplomatist. He was an attaché at Vienna in 1824, and was afterwards successively promoted to be secretary to the legation at Stuttgart, and to the embassy at Constantinople. He then acted as minister plenipotentiary to Switzerland (1848), and to the Germanic Confederation in 1851, and in the following year succeeded the Marquis of Normanby as ambassador at Paris. In this position he displayed eminent qualifications; and he held the appointment, whether his party was in or out of office, till 1867, when he resigned. With the Earl of Clarendon he represented Great Britain at the Paris Congress of 1856. He was created Viscount Dangan and Earl Cowley in 1857.

COW-PARSNIP (*Heracleum*). A genus of plants of the natural order Umbelliferae. One species, *Heracleum spondylium*, is a native of Great Britain, the common cow-parnsnip, or hogweed, called *kiesh* in Scotland; a common and rank weed, with coarsely hairy leaves, and stem about three to five feet high. It is gathered in some parts of England for fattening hogs, and is said to afford wholesome food for cattle. Some Siberian species are much larger, and have been recommended for cultivation on account of the great quantity of herbage which they yield very early in the season, particularly *Heracleum panaces*, which sometimes attains a height of ten feet, and whose root leaves are three to five feet long. *Heracleum lanatum*, a tall, stout, woolly perennial with grooved stems, and large compound leaves, is known as cow-parnsnip in the United States and Canada, being quite widely

distributed. In Alaska the leafstalks are peeled and eaten. It is there sometimes called wild celery. The stalks when drying exude a sweet substance, and they are said to be fermented and a liquor distilled from them in Siberia.

COWPEA (*Vigna catjang*). A leguminous plant indigenous to southeastern Asia, the Malay Archipelago, and parts of Central Africa. Its culture for human food and as a forage plant has spread to most tropical and sub-tropical countries. It was introduced into the United States early in the eighteenth century. At present it is a very common forage crop in the South, and is also grown to some extent in the Northern States. The plant is really a bean, and is closely related to the garden beans, such as the lima, the haricot, and others. The tendency of the cowpea to vary in habit of growth, color of leaf, stem, and pod, and in the shape and color of the seed gives rise to numerous varieties. (For illustration, see Plate of LEGUMES.) In the southern United States it grows as a vine with a rather long period of growth, but when grown in the Northern States it becomes a bush form and shortens its growing period. In addition to being a very important forage plant, it is especially valuable as a soil renovator, having the power of gathering the free nitrogen of the air in common with the clovers (q.v.).

Food and Feeding Value.—The green fodder has the following average percentage composition: Water, 83.6; protein, 2.4; fat, 0.4; nitrogen-free extract, 7.1; crude fibre, 4.8; and ash, 1.7; the cowpea hay the following: Water, 10.7; protein, 16.6; fat, 2.9; nitrogen-free extract, 42.2; crude fibre, 20.1, and ash, 7.5. The silage resembles the green crop in composition, containing some 80 per cent. of water, 3 per cent. of protein, and 8 per cent. of nitrogen-free extract, in addition to small amounts of the other constituents. Young pigs thrive on the cowpea forage and well-filled pods, and it is a custom to turn them into the fields planted for green manuring, about the time the first pods are ripening. An acre will pasture fifteen or twenty pigs for several weeks. The manure more than compensates for the vines eaten. Turkeys and chickens eat the ripe peas and do well on them. Cattle, sheep, and horses are sometimes pastured on cowpea, but the safest and most economical method is to cut or pull the vines and feed them partially wilted. Cattle and sheep are liable to bloat if they are allowed to eat too ravenously of cowpea vines, as is the case with other succulent crops. Cowpea hay compares favorably with other leguminous hays in digestibility; 59 per cent. of the total dry matter, 65 per cent. of the protein, 71 per cent. of the nitrogen-free extract, and 42 per cent. of the crude fibre being digested on an average. Like other leguminous seeds, the cowpea seed is rich in protein. It contains on an average: Water, 14.8; protein, 20.8; fat, 1.4; nitrogen-free extract, 55.7; crude fibre, 4.1; and ash, 3.2 per cent. Cowpeas, whole or ground, are sometimes fed to farm animals, but it is usual to harvest only enough for seed. As a food for man, cowpeas are much relished. In season, they are often gathered before the pods begin to change color and before they become dry. The shelled peas are then cooked in the same way as shell-beans or garden peas. For winter use the dry cowpeas are cooked like other dry beans, and have a very agreeable flavor. The plant is injured by a weevil (*Bruchis*

chinensis), to be recognized by two elevated, ivory-like lobes on the thorax; and by the September brood of the boll-worm (q.v.).

COWPEN. A town in Northumberland, England, on the south shore of the Blyth Estuary, 6½ miles east-southeast of Morpeth (Map: England, E 1). The town owns its markets and water-works. Its industries are connected with collieries and domestic manufactures. Population, in 1891, 13,000; in 1901, 17,800.

COWPENS. A town in Spartanburg County, S. C., noted chiefly for the battle which took place there on January 17, 1781, between 1100 British under Colonel Tarleton and 1000 Americans under General Morgan. This engagement, sometimes called the 'Bennington of the South,' for its decisiveness, was won for the Americans, partly by the rashness of the impetuous Tarleton, but especially by the daring position assumed by the American commander and the tactical skill he displayed in defending it. Losses—British, 800 killed, wounded, and captured; American, 12 killed, 60 wounded.

COWPER, kōō'pēr or kou'pēr, FRANCIS THOMAS DE GREY, Earl (1834—). An English statesman. He was educated at Christ Church, Oxford, and succeeded to the hereditary title in 1856. He was Lord Lieutenant of Ireland from 1880 to 1882, when he was succeeded by Lord Spencer, and proved a most able administrator during the critical period of the Land League. His antagonism to the Home Rule policy of Mr. Gladstone is well known. He was one of the founders of the Unionist party, and presided as chairman at the so-called 'Opera House Meeting.' Upon the installation of Lord Salisbury, he was appointed chairman of the commission in the Irish Land Act of October, 1881. He was also a member of the Gresham University Commission of 1892.

COWPER, WILLIAM, Earl (c.1664-1723). An English judge and the first Lord Chancellor of Great Britain. He was called to the bar in 1688 and was made King's Counsel in 1694. In the following year he entered Parliament, where he became known as an excellent debater, and was made lord keeper of the great seal. In 1706 he was made a peer, and was one of the commissioners to negotiate the union of Scotland with England. In 1707 he was made Lord Chancellor, in 1716 Lord High Steward, and in 1718 became an earl.

COWPER, WILLIAM (1666-1709). An English surgeon, born at Petersfield in Sussex. He was made a barber-surgeon in 1691, and became known not only as a skillful practitioner, but also as a thorough anatomist and pathologist. Among his permanent contributions to anatomical science, the discovery of the now so-called Cowper's glands (q.v.) will preserve his name. In 1696 he was made a fellow of the Royal Society. His published works include the following: *Myotomia Reformata* (1694; 2d ed., revised by Jurin, Pemberton, and Tanner, 1724); *The Anatomy of Human Bodies* (1698; 2d ed. 1737); *Glandularum Quarundam nuper Detectarum Ductuumque earum Excretionum Descriptio cum Figuris* (1702).

COWPER, WILLIAM (1731-1800). An English poet, son of John Cowper, D.D. He was born at his father's rectory, at Great Berkhamstead, Hertfordshire. Losing his mother when

he was only six years old, Cowper, who was naturally a delicate and sensitive child, became, as a boy, very deeply melancholy and depressed. Just after his mother's death he was placed in the school of a Dr. Pitman, in Market street, Hertfordshire. Removed because of cruel treatment by another boy, he was sent, at the age of ten, to Westminster School. The period he spent here was very miserable, and laid the foundation of that settled gloom which oppressed him till death. It is to the remembrance of these wretched days that we are indebted for the fierce invective that burns in the *Tirocinium, or a Review of Schools* (1784). Shortly after leaving Westminster, Cowper was articled to a Mr. Chapman, an attorney in London. Upon leaving Chapman's office he entered the Middle Temple. In 1754 he was called to the bar, but never practiced. His father died in 1756, and left him a small patrimony. In 1759 he removed to the Inner Temple, but his hatred of the law was so great that he seldom opened a book that bore on his profession. Yet he was industrious enough; he scribbled poetry, read Homer, and, in conjunction with his brother, translated some of the books of Voltaire's *Henriade*. In 1763 his cousin Major Cowper offered him the office of clerk of the journals of the House of Lords, which he accepted, but having to undergo an examination at the bar of the House, he was seized with nervousness, and could not appear. He even attempted suicide, but fortunately failed for want of courage. In December, 1763, he was removed to the private asylum of Dr. Cotton at Saint Albans, a prey to the deepest remorse. After his removal from Saint Albans (1765) he went to reside in the town of Huntingdon. Here he met Mrs. Unwin—the Mary of his poems—an acquaintance which ripened into the deepest friendship, and continued till death. After a few months in lodgings he resided with the Unwins, and enjoyed much tranquil happiness under that religious roof. Soon after the death of Mr. Unwin (1767) Mrs. Unwin and Cowper removed to Olney in Buckinghamshire. Here Cowper's malady returned. At this time he was engaged to marry Mrs. Unwin. She carefully tended him through his long and slow recovery. He found amusement in gardening, writing playful poems, and in building the famous summer house. Mrs. Unwin also suggested, as a subject suited to his genius, *The Progress of Error*. During the winter of 1780-81 he wrote *Truth, Table Talk, The Progress of Error, and Expostulation*, published in 1782. In 1781 Cowper made the acquaintance of Lady Austen, who suggested to him *The Task*, urged him to translate Homer, and—what the world is perhaps still more grateful for—she related to him the history of John Gilpin. *The Task* was begun in the summer of 1783, and published in 1785. Its success was great, and Cowper began to be considered the first poet of his day. In 1784 he began the translation of Homer, which appeared in 1791. It was received with great applause. Though Cowper wrote after this the beautiful and tender poem *To Mary*, his powers rapidly declined. He died at East Dereham, Norfolk. The centenary of his death was appropriately observed at Olney. Cowper's poetry is eminently healthy, natural, and unaffected. He and Burns brought back nature to English poetry. Besides being a poet, he was perhaps the most delightful letter-writer in the

English language. Nothing can surpass the charm of his epistles—full of humor, gentle sarcasm, anecdote, acute remark, and a tender shadow of melancholy thrown over and toning down the whole. The standard edition of Cowper's works is Southey's (15 vols., London, 1834-37, reprinted in Bohn's Library). Consult, also: *The Globe Edition of Poetical Works*, ed. Benham (London, 1870); the Aldine Edition, by Bruce (London, 1896); *The Unpublished and Uncollected Poems*, ed. Wright (London, 1900); and the lives of Cowper, by G. Smith (London, 1880) and by Wright (London, 1892).

COWPER'S GLANDS (discovered by the English anatomist William Cowper). Two small yellow glands, which are situated beneath the anterior portion of the membranous urethra in the male. The glands are of the racemose variety (see GLANDS), each one being made up of a number of small lobes, which are again subdivided into lobules. The acini are lined with low cuboidal epithelium, of the clear mucous type. The gland secretes mucus, which is carried by a small duct to the posterior part of the bulbous urethra. The vulvo-vaginal glands, or glands of Bartholin of the female, are the analogues of Cowper's glands.

COW-PILOT. A small fish (*Pomacentris saxatilis*) so called in Bermuda because it is believed always to accompany the cowfish (*Ostracium*). It is one of the demoiselles, and is also called 'mojarra.'

COW-POX. See VACCINATION; also SMALL-POX.

COWRY (Hind. *kauri*, Beng. *kari*, from Skt. *kapardikā*, shell). A gastropod mollusk of the family Cypræidæ, whose shells are shaped somewhat like coffee-beans, richly enameled and often beautifully marked. They are most abundant and attain their largest size in the seas of warm climates. The money cowry (*Cypræa moneta*) has long been in general use as a substitute for coin in many parts of Asia and Africa. It is yellow, or white, about an inch long, and nearly as broad; is found on the Indian coasts, and in particular abundance on those of the Maldive



A LIVING COWRY.

The animal is shown in the attitude of creeping (toward the left). The mantle is, however, withdrawn somewhat, revealing the normally clothed and protected shell. The short siphons and long tentacles appear, the last bearing the eyes, one of which appears as a black dot.

Islands, and has been one of their principal exports. In Bengal 3200 cowries were reckoned (in 1900) equal to a rupee, so that a cowry was then about equal in value to $\frac{2}{2500}$ of a cent. Yet cowries to the value of 200,000 rupees are said to have been at one time imported annually into Bengal. Many tons of cowries are annually used in trade with west-central Africa, but their circulation is fast disappearing. Consult Stearns, "Ethno-conchology: A Study of Primitive

Money," in *Smithsonian Reports for 1897*, pt. ii. (Washington, 1889). See SHELL-MONEY; also Colored Plate of MARINE GASTROPODS.

COW SHARK. A large shark of the tropical family Hexanchidae.

COWSLIP (AS. *cūslippe*, *cūstoppe*, from *cū*, cow + *slyppe*, *sloppc*, sloppy droppings, from *slūpan*, to dissolve, Engl. *slop*; alluding to the pastures where it is usually found; according to a euphemistic popular etymology *cow's-lip*) (*Primula officinalis* or *Primula vulgaris*). A common native of pastures in Europe; a delicate and modest little flower, a universal favorite, both for its beauty and its fragrance. (For illustration, see Plate of CRANBERRY, ETC.) The flowers have sedative properties, and are sometimes used as an anodyne and anti-spasmodic. They are fermented with sugar to make cowslip wine, an agreeable and favorite soporific domestic medicine. The name American cowslip, or shooting-star, is given to *Dodecatheon media*, a perennial plant, also of the natural order Primulaceæ, a native of North America, with a stalk about eight inches high, bearing an umbel of gracefully pendant lilac, rose-color, or white flowers, the petals reflexed over the calyx, the stamens and pistil long, and the anthers of a golden color. It is very ornamental in the flower-border, resembling a eyelamen. There are a dozen or more additional species and numerous varieties in the United States. See PRIMULA.

COX, DAVID (1783-1859). An English painter in water-colors and oils, the greatest English water-colorist. He was born at Deritend, near Birmingham, April 29, 1783, the son of a blacksmith. He studied drawing under Joseph Barber, of Birmingham, and water-color under John Varley in London. He was at first a scene-painter in theatres, and for a long time supported himself by teaching drawing, until at length there came patronage sufficient for his moderate desires. In 1805 he traveled in Wales, the scenery of which from this time became the favorite subject of his paintings. In 1813 he was made a member of the Society of Painters and Water-Colorists, and in 1814 he published his *Treatise on Landscape Painting and Effect in Water-Colors*. He did not begin the study of oil-painting until his fifty-sixth year, under Müller in London, but he attained great proficiency. Indeed, there is reason to believe that had he practiced it from the beginning he might have equaled Constable. In 1841 he retired to Harbourne, near Birmingham, where he resided until his death on June 7, 1859. Cox is certainly the most important of the successors of Constable. His work is bold and aims at a general effect, disregarding small and conflicting details. His colors are those of nature, pure, fresh, and rich, and he handles light with consummate skill. His treatment of atmosphere and atmospheric mood is of the highest order. His small productions are usually better than the larger. He is the great painter of Welsh scenery, of which he was particularly fond. The British Museum and the South Kensington Museum possess some of his drawings, but the best of his work is in private possession. Several general exhibitions of his work have been held, the best of which was that of Manchester in 1887. Among his best water-colors are the "Hay Field" (1843), "Bolton Abbey" (1847), and the "Welsh Funeral"

(1850); among his oils, the "Vale of Clwyd" and "Peace and War." His son DAVID COX, the younger (1809-85), was also a water-colorist of repute, but not of the same ability as his father. Consult: Hall, *Biography of David Cox* (London, 1881); Solly, *Memoir of David Cox* (London, 1875).

COX, Sir GEORGE WILLIAM (1827—). A British divine and scholar. He was born at Benares, India, but was taken to England when eight years old. He studied at Rugby and Oxford; took orders; was appointed curate of Salcombe Regis, near Sidmouth; and later was rector of Scrayingham, York, from 1881 to 1897, when he resigned with a pension from the Civil List. He is a leading exponent of the sun-myth theory in comparative mythology, and has published *Poems Legendary and Historical* (1850); *Life of Saint Boniface* (1853); *Mythology of the Aryan Nations* (1870); *History of Greece* (1874); *The Crusades* (1874); *The Athenian Empire* (1876); *British Rule in India* (1881); *Life of Bishop Colenso* (1888); and *The Church of England and the Teaching of Bishop Colenso* (1888). In 1891 he was chosen Bishop of Natal by the friends of Bishop Colenso (q.v.), but was refused consecration by the archbishops and bishops of England.

COX, JACOB DOLSON (1828-1900). An American soldier, politician, educator, and military historian. He was born in Montreal, Canada, was taken by his parents to New York City in 1829, graduated at Oberlin College in 1851, taught school at Warren, Ohio, in 1852, and there in the following year began the practice of law. From 1859 to 1861 he was a member of the State Senate, and in April, 1861, upon the outbreak of the Civil War, was appointed brigadier-general of Ohio volunteers. He took a prominent part in the Kanawha Valley campaign under McClellan in the summer of 1861; commanded the Ninth Corps of the Army of the Potomac in the battles of South Mountain and Antietam in 1862; commanded the Federal forces in West Virginia in the winter of 1862-63 and the military district of Ohio from April to December, 1863; was in command of the Twenty-third Army Corps during General Sherman's Atlanta campaign and the Franklin and Nashville campaign; was commissioned major-general of volunteers in December, 1864; and early in 1865 was sent to North Carolina to open communications with General Sherman, with whom he effected a junction at Goldsboro soon afterwards. In 1866 he resigned from the service. After the close of the war he served as Governor of Ohio in 1866 and 1867, attracting attention by his opposition to the policy of his party (the Republican) on the question of negro suffrage; and from March, 1869, until December, 1870, when he resigned, was Secretary of the Interior in the Cabinet of President Grant. He then again practiced law, was president of the Wabash Railroad for several years, was a Republican member of Congress from 1877 to 1879, was dean of the Cincinnati Law School from 1881 to 1897, and for a short time after 1885 was also president of the University of Cincinnati. He wrote many magazine articles, mostly on subjects connected with the Civil War and with microscopy, in which he attained considerable eminence, and published the following valuable works on the

military history of the Civil War: *Atlanta* (1882); *The March to the Sea: Franklin and Nashville* (1882); *The Second Battle of Bull Run as Connected with the Fitz-John Porter Case* (1882); and *The Battle of Franklin* (1879). His *Military Reminiscences of the Civil War* (2 vols.) were published posthumously in 1900.

COX, KENYON (1856—). An American painter. He was born in Warren, Ohio, October 27, 1856. He studied in Cincinnati and Philadelphia, and at the age of twenty-one went to Paris, where he remained seven years, under the instruction principally of Carolus Duran and Gérôme. On his return to America he became a member of the Society of American Artists in New York. The portrait of the sculptor Augustus Saint-Gaudens (1887), which took the medal at the Paris Exposition, and "An Eclogue" (1890) are among his best easel pictures. Examples of his mural decoration are to be seen in the Congressional Library at Washington and at Bowdoin College. He is noted for his large sense of form and competent drawing. He received several medals at Paris expositions. He was elected an associate of the National Academy of Design in 1900.

COX, LOUISE (1865—). An American artist, born in San Francisco. In 1892 she married Kenyon Cox, the well-known figure-painter. She is herself an artist of considerable ability. In 1896 she won the third Hallgarten prize, and in 1900 a bronze medal at the Paris Exposition of that year.

COX, PALMER (1840—). An American artist and author, born in Quebec. He lived for a time in California and began his career by writing for the *Golden Era* and other Western papers, but in 1875 went to New York City, where he still lives. Mr. Cox's productions are almost exclusively in the field of fancy, the most widely known being his sprightly verses and drawings of the *Brownies*, whose experiences fill several volumes.

COX, RICHARD (1500-81). An English bishop, born in Buckinghamshire. He was educated at Eton and Cambridge, and was tutor to Prince Edward, who, when he became King, made Cox one of the Privy Council and King's almoner. In 1537 he became chaplain to Archbishop Cranmer and the King, and a member of the commission that nullified the marriage of Anne of Cleves. In 1549 he was one of the seven royal visitors who led the King's attack on the religious, educational, and charitable establishments of England. Mary put him in prison, but he escaped to Frankfort, where he became the bitter opponent of John Knox. Elizabeth restored him to the See of Ely. Cox translated the four Gospels, the Acts, and the Epistle to the Romans, for the Bishop's Bible, and wrote a number of polemical essays.

COX, SAMUEL (1826-93). An English Baptist biblical expositor, born in London. He graduated at Steney Baptist Theological College, London, in 1851; was pastor at Southsea (1852-54) and at Ryde, Isle of Wight (1854-59). He was compelled by throat trouble to stop preaching for a while, but was pastor in Nottingham from 1863 till 1888, when failing health compelled his resignation. He died at Hastings, March 27, 1893. His fame rests upon his biblical exposition and his connection with *The Ex-*

positor, a monthly devoted to biblical topics, which he originated and whose first twenty volumes he edited (1875-84). Having become an advocate of Universalist views, he was obliged to resign his position. His publications were very popular and merited their wide sale. Of them may be mentioned *The Private Letters of Saint Paul and Saint John* (London, 1867); *The Quest of the Chief Good* (1868; rewritten as *The Book of Ecclesiastes, with a New Translation*, 1890); *An Expositor's Note-Book* (1872); *The Pilgrim Psalm* (1874); *Salvator Mundi* (1877) and *The Larger Hope* (1880), which two books on eschatology stirred up much controversy; *A Commentary on the Book of Job, with a Translation* (1880); *Expositions* (4 vols., 1885-90); *The Bird's Nest and Other Sermons for Children of All Ages* (1886); *The Hebrew Twins: A Prediction of God's Ways with Jacob and Esau* (London, 1894). Consult the prefatory memoir by his wife in the last-mentioned work.

COX, SAMUEL HANSON (1793-1881). An American clergyman, born in New Jersey. He began to study law, but left it for theology, and was ordained a Presbyterian minister in 1817. Three years later he had charge of a church in New York City, and was mobbed on account of his anti-slavery sentiments, his house and church being sacked. In 1834 he was chosen professor of sacred rhetoric in the theological seminary at Auburn, N. Y., and in 1837 became pastor of the First Presbyterian Church in Brooklyn, where he remained until 1854. He was, in the meantime, professor of ecclesiastical history in Union Theological Seminary. At the time of the division of the Presbyterian Church in 1837 he became a leader in the 'New School' branch. On several occasions he was a delegate to conventions in Europe, and at one time was moderator of the General Assembly. In 1854 his voice failed, and he resigned his pastorate. Among his published works are: *Quakerism not Christianity: Interviews, Memorable and Useful*; and many discourses.

COX, SAMUEL SULLIVAN (1824-89). An American politician and author, born in Zanesville, Ohio. He graduated at Brown University in 1846, and was later admitted to the bar, but forsook the law in 1853 to become editor of the *Ohio Statesman* at Columbus. For one year he was secretary of legation in Peru. He represented Ohio in Congress for eight years (1857-65), and New York, whither he removed in 1866, for seventeen years (1869-73, 1875-85, and 1886-89). In 1885-86 he was Minister to Turkey. He was popularly known as the 'letter-carriers' friend' in reference to legislation proposed by him for increase in their salary and the concession to them of a vacation with pay. A statue of him was erected by the letter-carriers in New York City. Mr. Cox wrote and lectured a great deal, some of his works being: *Eight Years in Congress* (1865); *The Buckeye Abroad* (1851); *Why We Laugh* (1876); and *Three Decades of Federal Legislation* (1885). A gorgeous piece of descriptive writing published in the *Statesman* during his editorship won him the nickname 'Sunset,' which clung to him through life.

COXALGIA (Neo-Lat., from Lat. *coxa*, hip, Gk. *άλγος*, *algos*, pain), or COXITIS. An obsolete name of hip-joint disease. Either arthritis or suppuration occurs in the joint, with the result

that in the former case the joint becomes immovable, or, in the latter case, the bones forming the joint become disintegrated.

COXCIE, kòk'sè, or **COXIS**, MICHEL (1499-1592). A Flemish painter, known by his copy of the "Adoration of the Lamb," from the original, made by the brothers Van Eyck, for Philip II. of Spain. Parts of this copy are now in the galleries of Berlin, Munich, and Ghent. His illustrations of the story of Cupid and Psyche have furnished models for innumerable paintings and engravings.

COXCOMB, kòks'kòm. THE. A comedy by Beaumont, Fletcher, Rowley, and others (1612), dealing with an experiment in self-sacrifice made by the coxcomb Antonio.

COX'COX'. The legendary Noah of the Mexican tribes, who with his wife escaped the Deluge. In its present form the legend shows probable Christian influence from early Spanish missionaries.

COXE, ARTHUR CLEVELAND (1818-96). An American prelate, second Protestant Episcopal Bishop of Western New York. He was born at Mendham, N. J., graduated at the University of New York in 1838, and at the General Theological Seminary in 1842, and in the same year was ordained priest. Rector at Hartford, Conn., in 1842-54, at Baltimore, Md., in 1854-63, and at New York City in 1863-65, he was in 1865 appointed to the bishopric of Western New York. In 1872 he visited Haiti, for the purpose of establishing churches and ordaining clergy in that island. He also founded the Christian Literature Company, of whose publications he edited a series of the Ante-Nicene Fathers. His writings include several volumes of verse, of which the *Christian Ballads* (1840; rev. ed., 1887) is the best known; and several theological works, such as *The Criterion* (1866), in opposition to the Tractarians; *Apollos, or the Way of God* (1873); and *The Institutes of Christian History* (1887).

COXE, HENRY OCTAVIUS (1811-81). An English scholar. He was born at Bucklebury and was educated at Oxford. From his appointment as under librarian at the Bodleian Library in 1838 until his death he devoted himself to the compilation of the colossal catalogue, comprising 723 folio volumes. In 1860 he became chief librarian of the institution. His other important publications include Roger de Wendover's *Chronica sive Flores Historiarum* (5 vols., 1841-44); *Metrical Life of Edward the Black Prince* (written in French, by Chandos Herald), with a translation and notes (1842); and Gower's *Vox Clamantis* (1850).

COXE, REGINALD CLEVELAND (1855—). An American artist, born in Baltimore, the son of Arthur Cleveland Coxe, Bishop of Western New York. He was a pupil of Bonnet in Paris, and is known especially as a painter of marines, and also as an etcher.

COXE, TENCH (1755-1824). An American political economist, born in Philadelphia. He served in the Continental Congress (1788), and was appointed Assistant Secretary of the Treasury in 1789. In the same year he proposed the introduction of Sir Richard Arkwright's cotton-spinning frame into the United States. The extensive planting of cotton in the South was

due chiefly to his initiative, for which reason he is frequently called the 'father of the American cotton industry.' Among his numerous works on economic subjects are: *An Inquiry into the Principles for a Commercial System for the United States* (1787); *View of the United States* (1787-94); and *On the Navigation Act* (1809).

COXE, WILLIAM (1747-1828). An English historian. He was born in London, and was educated at Cambridge. In 1771 he took the curacy of Denham, but soon resigned to become the tutor of several young noblemen. With them he spent many years in travel, and with great industry collected information of all kinds, which appears in many volumes of travels and history, all of which are characterized by close observation, care, and research. One of the best known of Coxe's works is his *History of the House of Austria from 1218 to 1792* (1807). He also wrote: *Memoirs of the Bourbon Kings of Spain from 1700 to 1788* (1813); *Memoirs of John, Duke of Marlborough* (1818-10); a *Life of Guy*, published separately from his *Fables* (1797); *Memoirs of Sir Robert Walpole* (1798); and *Memoirs of Horatio, Lord Walpole* (1802).

COXSWAIN (also *cockswain*, from *cock*, from OE., Fr. *coque*, boat, probably from ML. *concha*, small boat, from Lat. *coucha*, Gk. *κόχη*, *kouchē*, Skt. *śaṅkha*, shell + *swain*, AS. *swein*, from Icel. *sveinn*, OHG. *sucin*, herdsman). A petty officer in the navy who has charge of a boat and crew in the absence of officers. In double-banked boats he steers, and has a small seat in the *coxswain's box*, or after part of the boat abaft the stern-sheets. In single-banked boats the coxswain usually pulls the stroke oar. The steersman of a racing or other crew is also known as a coxswain.

COX'WELL, HENRY TRACEY (1819—). An English aeronaut. He was born at Wouldham, near Rochester Castle, and was educated at the Chatham Military School. He invented a balloon from which aerial torpedoes could be discharged, and made hundreds of ascensions, the most important being that undertaken with Glaisher in 1862, when the balloon sailed to a height of seven miles. During the Franco-German War he joined the aeronautic corps of the German Army. In 1845 he established the *Ærostatic Magazine*. His principal work is entitled *Life and Balloon Experiences* (1887-89).

COYOTE, kí'ò-tè or kí'òt (Sp., from Mex. *coyotl*). The modified native Mexican name of the prairie-wolf (*Canis latrans*), now universally adopted throughout the western United States. The coyote in several varieties is abundant almost everywhere from the Plains to the Pacific, south of central British Columbia, and is famous for its monotonous and reiterated yelping at night. This more resembles the barking of a dog than the howl of the ordinary wolf, and an early name was 'barking wolf.' One thinks half a dozen are yelping in chorus as he listens to it. It generally travels in packs, like other wolves, but, unlike them, it rarely attacks human beings. It is of rather small size, about as big as a setter dog, of a light reddish or yellowish-gray color, the longer hairs of the back tipped with black. The pelage is rather full and soft, the tail is bushy, the ears are upright, and the muzzle is slender and pointed. Several species are recognized by some naturalists, which others regard as geogra-

phical races only. Coyotes live in hollows among rocks, or take possession of old burrows in the ground, and usually produce four puppies in late spring. They hunt chiefly in the dusk. They are very fleet of foot, and two or three by acting in concert will run down a pronghorn; they seek to detach and seize the fawns, however, rather than to pull down adults. Their food consists mainly of gophers, ground-squirrels, mice, ground-nesting birds, and similar small animals; and they have become a great nuisance in the neighborhood of ranches and isolated settlements, especially in winter, by attacking sheep, poultry, calves, etc. Adapting themselves thus readily to circumstances, and having extreme cunning in avoiding traps and poison, they survive among the sparser settlements of the West, and in some regions increase rather than diminish. They will cross with the domestic dog, producing fertile hybrids; and the Indians were accustomed to induce such mixture of blood. This animal entered more largely than almost any other into the mythology and folk-lore of the aborigines, especially west of the Rockies. Consult: Ingersoll, *Wild Neighbors* (New York, 1897); Elliot, *Synopsis of Mammals* (Chicago, 1901). See WOLF; and illustrations on Colored Plate of CANIDE, and on Plate of WOLVES AND DOGS.

COYPEL, kwä'pél', NATALIS or NOËL (1628-1707). A French historical painter, born in Paris. He was employed by Louis XIV, on the large decorative works in Versailles, the Louvre, the Tuileries, and Fontainebleau. In 1695 he was made perpetual director of the Academy. When past seventy-five, he painted two frescoes in the dome of the Hôtel des Invalides in Paris. His pictures are very numerous, and, in a somewhat theatrical style, impressive. His two sons, ANTOINE and NOËL NICOLAS, and his grandson CHARLES ANTOINE, became well-known painters and engravers.

COYPU, koi-pōw' (native South American name), or NUTRIA. An aquatic rodent (*Myopotamus coypu*), widely common in South America. Its name in Chile is 'coypu,' and on the Pampas 'quiqui,' but it is always called by Spanish-speaking people of education nutria ('otter'), by which name its fur is known in commerce. It is not an otter, however, but is nearly allied to the beaver, yet somewhat smaller, and with a rat-like tail. It is dull brown, with a grayish muzzle and bright-red incisors; the nostrils are very high, allowing it to breathe with only the tip of the nose above water; and the teats are high on the flanks. When the beaver became scarce the fur (nutria) of this animal was in great demand for making hats, etc., and the coypus were nearly exterminated, but with less demand and the protection of local laws they have again become numerous. It is thoroughly aquatic, dwelling preferably in the permanent ponds (lagunas) of the La Plata Valley, and inhabiting burrows in the banks, where there are banks, or making a platform nest among the rushes. "Of an evening they are all out swimming and playing in the water, conversing together in their strange tones, which sound like the moans and cries of wounded and suffering men; and among them the mother coypu is seen with her progeny, numbering eight or nine, with as many on her back as she can accommodate, while the others swim after her, crying for a

ride." For further interesting facts, consult: Hudson, *The Naturalist on the La Plata* (London, 1875); *Proceedings Zoological Society* (London, 1894); Semper, *Animal Life* (London and New York, 1881). See Plate of BEAVER, ETC.

COYSEVOX, kwä'z-vöks', ANTOINE (1640-1720). A French sculptor, born in Lyons. His master was the versatile Le Lambert. The most notable works of this sculptor are fine busts of his contemporaries, such as Lebrun, Richelieu, and Bossuet; one of the mother of the painter, and one of himself. He also modeled the statue of Louis XIV, at the Hôtel de Ville in Paris, and various decorations for the interior of Versailles.

COYUVO, kô-yōō'vō. The natives of Calamianes Province, P. I. They speak Tagbanua. See PHILIPPINES.

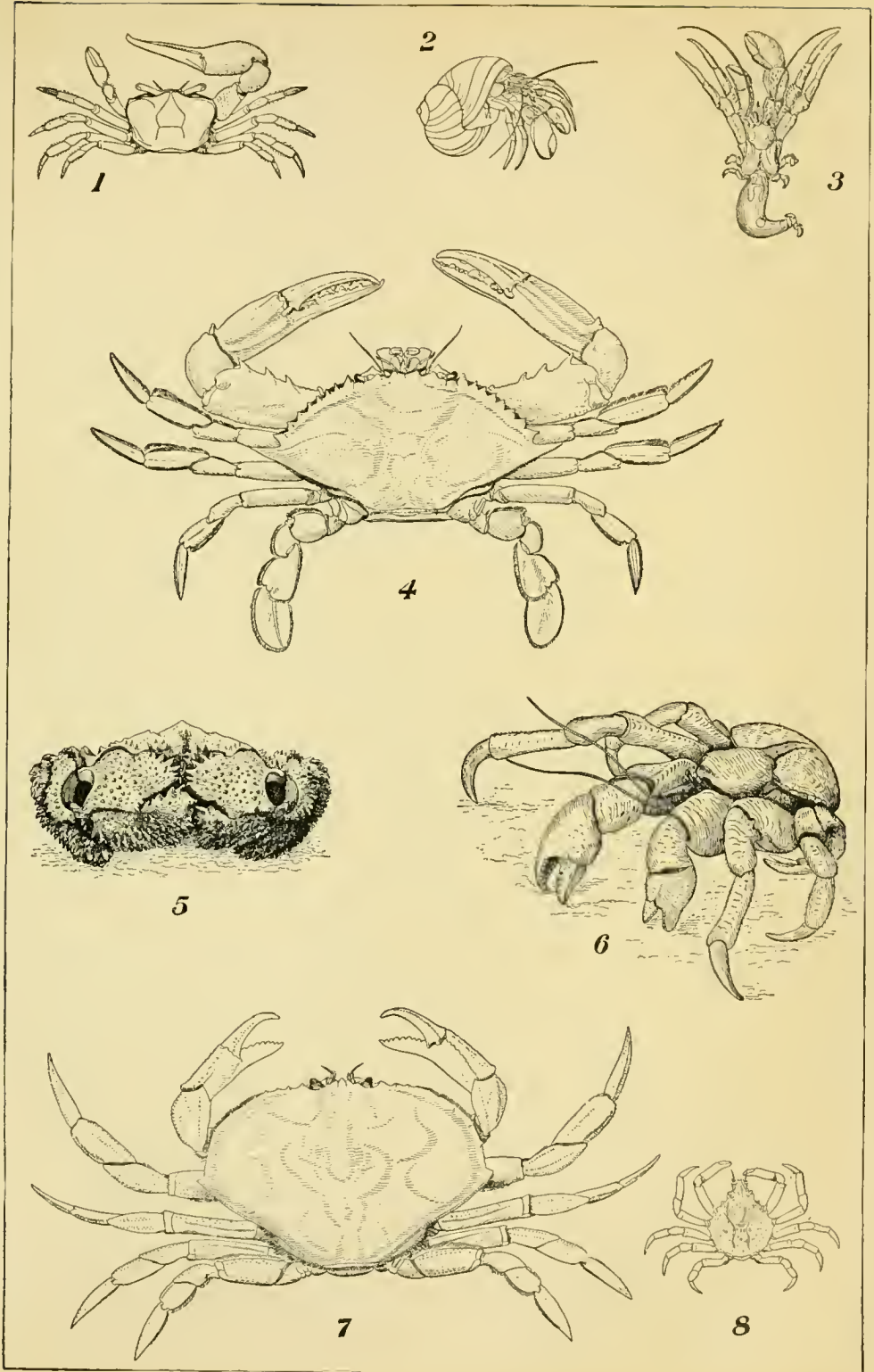
COZENERS, kūz'n-ērz, THE. A comedy by Samuel Foote (1774), in which he himself played the part of Aircastle.

COZENS, kūz'nz, JOHN ROBERT (1752-99). An English painter. His father was one of the two natural sons of Peter the Great of Russia by a woman of Deptford. He traveled in Italy and Switzerland and left valuable drawings made on that tour. Toward the end of his life he became insane. In his day water-color landscapes were very conventional in drawing and dry in color. Cozens was one of the first to show the value of this medium in the poetical quality of his work. Turner and Constable have spoken in terms of admiration of Cozens's pictures. There are a number of them in the British Museum, but the most famous is a landscape, "Hannibal Crossing the Alps" (1776).

COZUMEL, kō'sōō-māl'. An island off the eastern coast of the Mexican Province of Yucatan, in latitude 20° N. and extending east of longitude 87° W. (Map: Mexico, P 7). It is about 24 miles long and about 7 miles wide. Its surface is low and the coasts are bordered by reefs. There is a small Indian settlement by the name of San Miguel. The chief industry is cattle-raising. The island was discovered in 1518.

COZZENS, kūz'nz, FREDERICK SWARTWOUT (1818-69). An American humorist, born in New York City. He became in early life a wine-merchant, and later editor of the *Wine Press*, for which he wrote papers on the culture of the grape and the manufacture of wine, as well as miscellaneous essays. He had previously contributed humorous poems and articles to magazines, and in 1853 he issued his first volume, *Prismatics*, under the pen-name Richard Hayward. Then came the *Sparrowgrass Papers*, his best performance, first published in the *Knickerbocker Magazine*, and, in 1856, as a widely read volume. They dealt with the trials of a city man who undertakes to run a country home (near Yonkers), and although their humor is mild, they are still fairly readable. Three years later (1859) he published a volume of travel-sketches, *Acadia; or, A Sojourn Among the Blue Noses*. Soon after the war he failed in a business for which he had labored earnestly, especially by promoting the sale of native wines, and retired from Yonkers to Rahway, N. J. Of his other works only *Poems* (1867) and a *Memorial of Fitz-Greene Halleck* (1868) need be named.

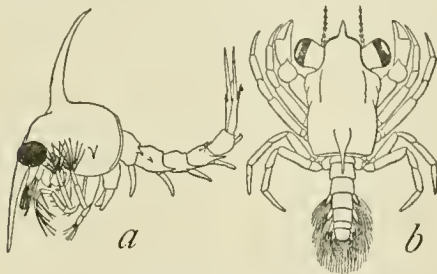
TYPICAL CRABS



1. FIDDLER CRAB (*Gelasimus pugnax*).
2. HERMIT CRAB (*Eupagurus longicarpus*) in a shell of *Natica heros*.
3. HERMIT, out of its borrowed shell, showing reduced and defenseless posterior parts.
4. EASTERN EDIBLE or BLUE CRAB (*Callinectes hastatus*).
5. A DEEP-SEA CRAB (North Atlantic) its arms closed into a defensive box.
6. COCONUT CRAB (*Birgus latro*).
7. COMMON CRAB OF PACIFIC COAST (*Cancer magister*).
8. SPIDER CRAB (*Libinia emarginata*).

CRAB (AS. *krabba*, Icel. *krabbi*, Ger. *Krabbe*). A crustacean of the order Decapoda and suborder Brachyura, characterized by the small size of the abdomen, which resembles a short tail curved under the thorax, all important viscera being included in the thorax. The term extends also to some of the suborder Anomura (purse-crabs, hermit-crabs, etc.), characterized by a condition of abdomen intermediate between that of the Brachyura and that of the Maerura, or long-tailed decapod crustaceans, such as the lobster, crayfish, etc. All the crabs, besides many other crustaceans, were comprehended in the Linnaean genus *Cancer*; but the number of species is very great, considerably more than 1000, and the Brachyura alone are now arranged in many genera and families.

These various crabs differ very much in the form of the carapace (the back), which in some is orbicular or nearly so; in some, much broader than it is long; in others, longer than broad; in some, prolonged in front into a kind of beak, etc.; also in its smoothness, or roughness with hairs, tubercles, or spines; in the length of the legs, etc. The eyes are compound, with hexagonal facets, and are elevated on stalks, which are generally short, but sometimes considerably lengthened, and which have the power of motion, so as to turn the eye in different directions. The first pair of limbs are not used for locomotion, but exhibit in great perfection the characteristic claws or pincers (*chela*) of the decapod crustaceans. Crabs are inhabitants of almost all seas; most of them, however, are found chiefly near the coast. Some crabs inhabit fresh water, particularly in the warmer parts of the world; and others, known as land-crabs, live among moist herbage, or burrow in sand or earth. Crabs are generally flesh or carrion eaters, though some forms seem to prefer a vegetarian's diet. They are always active and are noted for running sideways, rather than straight ahead. Some have the last pair of limbs expanded at the extremity into a broad blade for swimming, and some have even all the four pairs of limbs intended for locomotion thus expanded, and sometimes occur far out at sea.



LARVAL STAGES OF CRABS.

a, zoea stage; b, megalops stage.

Their development is accomplished by metamorphosis through succeeding stages. "In the crabs the nauplius stage (see CRUSTACEA) is passed through in the egg, and the young is hatched in the form of a peculiarly modified *zoea*, with an immense cephalothorax produced into spines, large stalked eyes, and a slender abdomen. This passes by successive molts into the *megalops* stage, which resembles an adult macruran [and] . . . passes by successive molts into the adult form."

Crabs, like all arthropods (see ARTHROPODA), molt or change their shell, not at fixed intervals or seasons, but according to the exigencies of their growth, the change being made with great frequency when they are very young, but rarely in advanced age; indeed, from the mollusks and other animals sometimes found adhering to the carapace, it is inferred that the same covering is sometimes worn for a number of years.

Crabs become interesting in the aquarium, from their readiness in seizing food, their activity in tearing and eating it, and their pugnacity. The number of specimens is apt, however, to be soon diminished by the stronger killing and eating the weaker. Crabs vary greatly in size and color, as might be expected from the great number of species and their wide distribution. The giant crab of Japan (*Macrochira Kampjerei*), although only a foot across the disk, which is 18 inches long, has such long legs as occasionally to be 15 to 18 feet from tip to tip of the first pair. The great stone-crab of Tasmania, which has short and very thick legs, has been known to reach a weight of over 30 pounds. On the other hand, many species of crab are only a fraction of an inch across. In color, crabs vary from black to white, through all the colors of the rainbow. Shades of green, blue, and gray are perhaps the most common, but the brightest shades of red and yellow are by no means rare. The sexes of crabs are easily distinguished, as the females are usually larger, and their abdomens broader and more oval, while males have the chela more powerfully developed—notably so in the fiddlers.

Economic Importance of Crabs.—These animals supply food for food-fishes, are of great service as scavengers, and are used as human food in various parts of the world. In the United States the principal crab so used is the blue crab (*Callinectes hastatus*), hundreds of thousands of which are sent to market every year from the waters of Chesapeake Bay alone. The little pea-crabs (Pinnotheres) often found in oysters (see COMMENSALISM) are regarded as a great luxury. In Europe the species most frequently used are those of the genus *Cancer*, especially the great *Cancer pagurus*, and there is no reason why the two eastern American species of this genus, the 'rock' and 'Jonah' crabs (qq.v.), should not be far more utilized as food than they are. To this group belong the principal edible crab of the American Pacific coast (*Cancer magister*), and others smaller which are eaten by the Chinese, etc. This species usually measures 7 to 9 inches in breadth of body, and abounds from Alaska to Mexico, usually below low-tide level on sandy bottom. Crabs which have just shed their shell, and are covered only by a soft skin, are regarded as best, and are called 'shedders' or 'soft-shelled.'

The ways of fishing are various. Many are taken in wicker traps or 'pots,' baited with meat or offal; another common method is to sink shallow hoop-nets of coarse material and mesh, which are baited and hauled up rapidly at intervals, bringing the crabs with them. Hand-line fishing, with bundles of meat to which the crabs cling until lifted out of water, is more a sport than a method of market-fishing; but in the Gulf of Mexico trawls or 'trot-lines' are set in several ways, and vast quantities of crabs are thus taken. They are kept for market in floating pens or

'ears,' and shipped alive packed in wet seaweed. They are also preserved by canning, etc.

FOSSIL FORMS. With the exception of some doubtful genera (Gitecragnon, etc.) from later Paleozoic rocks, no unmistakable fossil crabs are known from deposits antedating those of Mesozoic age. Fossil crabs first appear in the Jurassic, where occur members of the family Dromiacea, much smaller than the modern species, such as the genus *Prosopton*, which continues into the Cretaceous. In the Upper Cretaceous, *Dromiopsis* is the ancestor of *Dromia*, which latter appears in the Eocene and continues to modern time. Several other small genera of this same family are found in Cretaceous rocks, in which the family enjoyed its greatest expansion. The *Ranimoidea*, with elongated carapaces, broadly truncated in front, began in the Upper Cretaceous, had its maximum in the Eocene, and has since then declined to the present. Large numbers of the *Oxystomata*, or round crabs, are found fossil in the Upper Cretaceous and Eocene rocks. The *Oxyrhyncha*, which at present are very abundant, have few fossil ancestors, and these are of small size. The arcuate crabs, of the family *Cyclometopa*, contain the largest number of fossil genera. They appeared in the Cretaceous, attained a great expansion in the Eocene, declined during the later Tertiary, and in modern times seem to be again on the increase. This family contains most of the modern genera, such as *Cancer*, *Carcinus*, *Portunus*, *Xantho*, *Neptunus*, *Panopeus*. Certain of these are of old age. *Xantho* began in the Cretaceous, had a representative (*Xanthopsis*) that is very common in the Eocene of England, France, and Germany, and continued with little change to the present day. *Lobocarcinus*, with its broad, nodose carapace, deeply denticulate on the front margin, is a common and often beautifully preserved fossil crab from the Eocene rocks of Württemberg, Germany, and Cairo, Egypt. The *Catometopa*, or quadrangular crabs, have many ancestors of Eocene age. The first land-crab of the modern genus *Gecarcinus*, and the first fresh-water crab, also of a modern genus, *Telphusa*, both members of this family, are found in the Miocene deposits of Oeningen, Germany.

From the above remarks it will be seen that all the families of modern crabs, with the single exception of the *Oxyrhyncha*, were initiated during Cretaceous time; that they expanded rapidly so that their periods of maximum evolution were during the Eocene, when indeed crabs formed the dominant feature of the fauna in certain seas; that during the Miocene the general expansion was less than before, although certain genera were extremely abundant in particular localities; and that those of the Pliocene are mostly of recent species. During the present time the crabs seem to be enjoying another period of expansion, but along different lines from those of the Eocene evolution. The best collecting grounds are found in the Eocene deposits of the south of England; the nummulitic limestones of southern France, Switzerland, southern Germany, and of northern Italy, and those of central India; and the Miocene beds of Italy, Austria, Hungary, and Germany.

Consult: Zittel and Eastman, *Textbook of Palaeontology*, vol. i. (London and New York, 1900); Zittel and Barrois, *Traité de paléontologie*, vol. ii. (Paris, Leipzig, and Munich, 1887);

Bell, "Monograph of the Fossil Malacostracous Crustacea of Great Britain," *Paleontographical Society Monographs* (London, 1857-62); Ortmann, "Das System der Decapodenkrebse," *Zoologische Jahrbücher*, ix. (Jena, 1896); Lorenthey, "Ueber die Brachyuren der paläologischen Sammlung des Bayerischen Staates," *Természeti Füzetek*, vol. xxi. (Budapest, 1898). See CRUSTACEA, and special articles under names of various crabs, as KING-CRAB; SPIDER-CRAB, etc.

CRAB-APPLE. See APPLE.

CRABB, GEORGE (1778-1851). An English lawyer and author, born at Palgrave (Suffolk). He was educated at Oxford, admitted to the bar at the Inner Temple (1829), and practiced his profession in London. For a time, also, he was instructor in the classics in a Yorkshire school. His best-known work is the *Dictionary of English Synonyms* (3d ed., 1824), a careful, if not always scholarly, reference-book, which has appeared in numerous editions. Others of his publications are a *History of English Law* (1829), and a laborious *Digest and Index of All the Statutes at Large* (4 vols., 1841-47).

CRABBE, GEORGE (1754-1832). An English poet. He was born December 24, 1754, at Aldeburgh, Suffolk, where his father was collector of salt duties. Crabbe showed early a love for books, with a bias toward poetry. After some schooling, he was apprenticed first to a village doctor and then to a surgeon. By 1772 he was contributing verses to *Whistle's Magazine*, and two years later he published at Ipswich a moral poem entitled *Inebriety*. At this time he was in love with Sarah Elmy, whom he addressed in his poems as 'Mira,' and whom he afterwards married. Continuing his studies in London, he began the practice of medicine in the place of his birth. Disliking a profession in which he was not succeeding, he went to London in 1780 to begin a literary career. In that year appeared a poem called *The Candidate*, which was received coldly. Much distressed, he called upon Burke, who after reading some of Crabbe's verses took him under his protection, getting Dodsley to publish *The Library* (1781). While staying with Burke at Beaconsfield, he began his best-known poem, *The Village* (published 1783). At Burke's suggestion, Crabbe took orders. After a short period as rector of Aldeburgh, he was appointed chaplain to the Duke of Rutland (1782), and thus made Belvoir, Leicestershire, his home. After occupying several other church livings, he was given that of Trowbridge, Wiltshire (1814), where he remained till his death (February 3, 1832). Besides the poems already cited, Crabbe wrote *The Newspaper* (1785); *The Parish Register* (1807); *The Borough* (1810); *Tales in Verse* (1812); and *Tales of the Hall* (1819). Crabbe was a popular poet in his own time, numbering friends among the greatest. He was lavishly praised by Dr. Johnson, Scott, Wordsworth, and Byron. Jane Austen, charmed with humor akin to her own, declared that, were she ever to marry, she could fancy herself Mrs. Crabbe. Though his reputation has declined, he nevertheless occupies an important place in the progress of English poetry. Crabbe's stern descriptions of English life in old East Anglia were in marked contrast to Goldsmith's idyllic scenes, and led

the way to the realism of Wordsworth. What he lacked was the imagination necessary to give lasting interest to his subject. His great excellence is the directness with which he portrays the tragic life of men and women whom he knew and the scenes in which they lived. Consult: *Works*, with memoir, by his son G. Crabbe (8 vols., London, 1834-35); selections from poems, by Lamplough (London, 1888), and by Holland (London, 1899); Stephen's essay in *Hours in a Library* (London, 1876); Courthope's essay in Ward, *English Poets* (London, 1884); the *Life*, by Kibbet (London, 1888); and Ainger, *Crabbe*, in "English Men of Letters" Series (New York, 1902).

CRAB-EATER, or **COBIA**. See **SERGEANT-FISH**.

CRAB-EATING DOG, **RACCOON'**, ETC. See **DOG**; **RACCOON**, etc.

CRABETH, krá'bét, DIRK and WOUTER. Dutch painters on glass. They were brothers, born at Gouda, in South Holland, and they flourished in the latter half of the sixteenth century. As the brothers worked together and were the most famous glass-painters of their time, they cannot be separated in biography. Very little is known of their lives, but they executed a number of excellent works in the churches of Belgium and France. Their chief works are fourteen of the seventy-five windows of the great church at Gouda. Among the best of these are the "Baptism of Christ" and the "Last Supper," by Dirk, and the "Nativity" and the "Sacrilege of Heliodorus," by Wouter. The latter excels in brilliancy of color, but Dirk has a more vigorous style. The works of both show a somewhat mannered imitation of the Italian, but they still retain much of the brightness of the mediæval coloring. Dirk died in 1581; his brother about 1601. Consult Westlake, *History of Design in Painted Glass*, vol. iv. (London, 1894).

CRAB-GRASS. A name applied to *Panicum sanguinale*, an annual grass common throughout many parts of the United States. It is frequently seen to spring up in fields after the period of cultivation has passed. It grows to a height of two or three feet, bearing at the top three to twelve spreading purplish spikes which carry the flowers and seed. In many places it is considered a weed, but in the South it is valued for the hay it yields as well as for pasturage. The hay must be cured without rain falling upon it or its value is greatly impaired. It ranks close to Bermuda grass in the value and cheapness with which a crop may be produced. Eleusine indica is sometimes called crab-grass.

CRABIER, krá'byá' (Fr., crab-eater). The name in the French West Indies and Jamaica for several herons, especially the common night-heron (*Nycticorax violaceus*). See **NIGHT-HERON**.

CRAB'S-EYES. See **ABRUS**.

CRAB'S-POLOVER. A singular shore-bird (*Dromas ardeola*) nearly related to the oyster-catchers, but set apart in a family, Dromadidæ, of its own, which is to be found sparingly on the coasts and islands of the Indian Ocean. "Its habits remind us both of the plovers and the terns, and so do the unusually large eggs," but in India, according to Hume, it nests in burrows in sand-hills.

CRAB'SHAW, TIMOTHY. A plowman and carter, who becomes squire to Sir Launcelot Greaves, in Smollett's novel of the latter name.

CRAB-SPIDER. A spider of the family Thomisidæ, so named on account of the short, broad body and the fact that, like a crab, it runs more successfully sideways or backward than forward. These spiders spin no web, but await their prey hidden among foliage, and are colored in harmony with their background; but a few species are bright-colored and hide in flowers. The most common American form (*Misumena vatia*) is milk-white, occasionally with light-crimson markings. Another species (*Phidromus vulgaris*) eats house-flies almost exclusively. Consult: Emerton, *The Common Spiders of the United States* (Boston, 1902). Compare **BIRD-SPIDER**.

CRAB'TREE. Uncle of Sir Benjamin Backbite—a deaf, cross-grained old scandal-monger—in Sheridan's comedy *The School for Scandal*.

CRABTREE, SIR CADWALLADER. In Smollett's *Adventures of Peregrine Pickle*, the friend of the hero.

CRABTREE, CHARLOTTE (1847—). An American actress, known as Lotta. She was born in New York, and when a child of ten began her career in California. After starring for a time in the West, she came again to New York about 1860. In 1867, as Little Nell and the Marchioness in a dramatization of *Old Curiosity Shop*, she made her first great impression there, and became a popular favorite. Her success was entirely due to her personal charm. Critics found little to approve in the pieces in which she appeared, such as *The Little Detective*, *Zip*, *Musette*, and *The Firefly*, but her stage appearance was characterized by a naturalness and grace which won the hearts of the audience. She retired from the stage, still unmarried, in 1891, having acquired a fortune. Consult: Welch, in McKay and Wingate's *Famous American Actors of To-Day* (New York, 1896); and Clapp and Edgett, *Players of the Present*, Dunlap Society Publications (New York, 1899).

CRACKED HEELS. See **HORSE**.

CRACKER. See **BISCUIT**.

CRACKERS. A name given in the southern part of the United States to the poor and ignorant whites, probably because of their usual diet, which is cracked corn ground into a coarse meal. The term 'corn-crackers' is employed in the same sense.

CRACKER STATE. Georgia. See **STATES**, **POPULAR NAMES OF**.

CRACKLIN, or **CRACKLE WARE**. A kind of chinaware, the glazing of which is purposely cracked in the kiln, as an ornament, the effect being produced by a glaze which tends to contract in the burning more rapidly than the vessel itself.

CRACOW, krāk'kò (Pol. *Krakov*, Ger. *Krakau*, Fr. *Cracovie*, Lat. *Cracovia*, *Carodunum*; said to be named after its founder, *Krakus*, a legendary Slavic chief). The ancient capital of the Kingdom of Poland and residence of the Polish kings, now a fortified city of the Austrian Crown-land of Galicia (Map: Austria, F I). It is situated on the left bank of the Vistula, at its confluence with the Rudawa, about 10 miles from the frontier of Russian Poland and 256 miles north-

east of Vienna. Cracow, with its numerous churches, towers, and old castle, presents an imposing aspect from without. It consists of the inner town and a number of suburbs. The old walls surrounding the inner town have been demolished, and promenades laid out on their site. Cracow is one of the oldest cities of Poland, and bears the marks of its age in its imposing buildings as well as in its general appearance. First among the numerous churches of Cracow is the old Gothic cathedral, situated near the castle. It was erected under Casimir the Great, in the fourteenth century, and is famous for the numerous tombs of Polish kings and heroes it contains, including those of Sobieski, Poniatowski, and Kosciuszko. It is also adorned with numerous monuments, several of them by Thorwaldsen, and its treasury contains some remnants of the former splendor of Poland. The Church of Saint Mary, a Gothic basilica, was founded in the thirteenth century, and several times rebuilt since then. It contains a magnificent high altar by Veit Stoss, and a number of monuments. Besides these churches there are a number of very interesting mediæval ones. Among the interesting secular buildings is the former royal castle, situated on a broad hill at the southwestern end of the town; it was built in the thirteenth century, and suffered greatly from conflagrations; its remnants are used as barracks and a hospital. The old cloth-hall, dating from the thirteenth century, is now used as an art museum, and contains paintings by Polish artists, such as Matejko, Siemiradzki, and others. In front of the cloth-hall is a bronze statue of Mickiewicz, one of Poland's greatest poets. Among other notable buildings and historical monuments are the university, the old and new theatres, and the Rondell, a relic of the old fortifications. The chief educational institution is the famous university, styled the Jagellonian University, founded by Casimir the Great in 1364. It developed very rapidly, and eventually became the intellectual centre of Poland. At present it has faculties of jurisprudence, philosophy, and theology, with an attendance of over 1300 students. The university library contains over 300,000 volumes, besides numerous manuscripts, engravings, ancient documents, etc. Attached to the university are also an observatory, a botanical garden, a natural history museum, and a number of other institutions. Among other prominent educational establishments are the Royal Academy of Sciences, and the art school (until 1893 under the supervision of Matejko), several seminaries, and a number of artistic and literary societies. The Czartoryski Museum contains a collection of sculptures and antiquities and a fine picture gallery, with samples of the Italian and Dutch schools.

Economically Cracow is only of slight importance. The manufacturing industries include the production of machinery, textiles, leather, chemicals, etc. The trade is mostly in raw products, such as grain, wood, salt, animals. In the vicinity of the city is situated Kosciuszko Hill, a mound 65 feet high, erected in 1820-23 by the residents of Cracow, in honor of Kosciuszko, and since converted into a fort. The fortifications of Cracow are very extensive. Population, in 1890, 74,593; in 1900, 91,310; consisting mostly of Catholic Poles and Jews.

Cracow rose into importance in the Middle Ages

as the seat of a bishopric and a centre of commerce and trade, its prosperity being enhanced by the influx of German immigrants. It suffered terribly at the hands of the Tatars in the thirteenth century. It became the capital of Poland in 1320, and after having been superseded by Warsaw in 1610, it still remained the place where the Polish kings were crowned and buried. It later became exceedingly impoverished, so that at the end of the eighteenth century its population was only about 10,000. In 1655 and 1702 the town was taken by the Swedes. It was the starting-point of the rising of the Poles for independence under Kosciuszko in 1794, and came into the possession of Austria at the third partition of Poland, in 1795. From 1809 to 1815 Cracow formed a part of the Duchy of Warsaw. The short-lived Republic of Cracow, established at the Congress of Vienna in 1815, under the protectorate of Russia, Prussia, and Austria, was the last remnant of an independent Poland. It consisted of the city of Cracow and some adjacent territory, with a total population of about 140,000. The participation of a portion of the population in the Polish uprising of 1830 gave Russia an opportunity for military occupation. After that Cracow was repeatedly occupied by foreign troops. The little republic took a leading part in the Polish insurrection of 1846. The patriots were at first successful, but their overthrow soon ensued, and Cracow was annexed to Austria in the same year. In 1849 it was incorporated with Galicia. Cracow remains to the present day a great focus of Polish national life.

CRACOW, UNIVERSITY OF. See CRACOW.

CRADDOCK, CHARLES EGBERT. The *nom-de-plume* of Mary N. Murfree (q.v.), the Southern novelist.

CRADLE OF LIBERTY, THE. The name popularly given to Faneuil Hall, Boston, as the scene of early popular protests against British rule.

CRADOCK, KRÄD'OK, Sir. See CARADOC.

CRAFT OF LOVERS, THE. A poem assigned to Chaucer by John Stowe, who added this poem and a number of other spurious compositions, most of which were extremely inferior, to the edition of 1561. The author is unknown.

CRAFTS, JAMES MASON (1839-). An American chemist. He was born in Boston, and received his education at the Lawrence Scientific School of Harvard. In 1859 he went to Germany, and studied at the Academy of Mines of Freiberg and at the University of Heidelberg. At the latter institution he acted for some time as private assistant to Robert Bunsen. In 1861 he went to Paris, and there, in Würtz's laboratory, he first met Charles Friedel, in conjunction with whom he later carried out some of his most brilliant researches. In 1865 he returned to the United States, and, after devoting some time to mining, accepted the position of head professor of chemistry and dean of the faculty at Cornell University, where he remained until 1870. During the following four years he acted as professor of chemistry at the Massachusetts Institute of Technology, but in 1874 took leave of absence, joined Friedel in Paris, and devoted himself exclusively to scientific research. His investigations were mainly in the field of organic chemistry, but his name is connected also with many

interesting achievements in physics and in physical chemistry. He invented a new hydrogen thermometer; measured the densities of iodine at very high temperatures; demonstrated an interesting regularity in the variation of the boiling-points of chemically allied substances with the external pressure; prepared a number of new compounds of the element silicon, which are interesting because of their chemical resemblance to the corresponding compounds of carbon; and also prepared new compounds of arsenic. But his most important achievement was the discovery, jointly with Friedel, of one of the most fruitful synthetic methods in organic chemistry. According to an estimate published several years ago by Emil Fischer, the story of the results obtained by the method, or 'reaction,' of Friedel and Crafts is one of the most wonderful in the whole range of the science of chemistry. Hundreds of new carbon compounds have been brought into existence by this method, which is based on the action of the chloride of aluminum; and a host of compounds that had already been prepared by other methods of much greater complexity were produced by this method without any difficulty whatever.

In recognition of Crafts's services to science, the French Government made him a chevalier of the Legion of Honor (1885), and the British Association for the Advancement of Science made him one of its corresponding members. In 1891 he again returned to this country, and from 1892 to 1897 acted as professor of organic chemistry at the Massachusetts Institute of Technology. In 1898 he became the president of the institute, and in the same year Harvard University conferred upon him the honorary degree of Doctor of Laws. In 1900, however, he resigned the presidency of the Institute of Technology, and again turned to the investigation of problems in organic and physical chemistry. The numerous results of Dr. Crafts's researches were published in various scientific periodicals, mainly foreign. He also wrote a text-book of *Qualitative Analysis* (1869, and several later editions).

CRAFTS, WILBUR FISK (1850—). An American clergyman. He was born in Fryeburg, Maine; was educated at Wesleyan University and at the Boston University School of Theology; held various positions in the Methodist Episcopal Church, and in 1880 became a Congregational minister. From 1883 to 1888, however, he was the pastor of the First Union Presbyterian Church of New York. He conducted an International Sunday-School Parliament at the Thousand Islands in 1876-77, and is the author of a number of books designed primarily for the Sunday-school. He has also written: *Must the Old Testament Go?* (1883); *Successful Men of To-day* (1883); and *The Sabbath for Man* (1885), a strong presentation of the claim of the Lord's Day. He resigned his pastorate in 1888, to become secretary of the American Sabbath Union, and later became superintendent of the International Reform Bureau, organized to obtain legislation for moral purposes in the United States and Canada.

CRAFTSMAN, THE. A powerful journal organized in 1726 by Bolingbroke and Pulteney, with Nicholas Amhurst, who conducted it under the name of 'Caleb D'Anvers of Gray's Inn.' It

was the organ of the Opposition against Sir Robert Walpole.

CRAIG - MARTIN, or **ROCK-SWALLOW.** A swallow (*Circicola rupestris*), closely allied to the bank-swallow (q.v.), which is found from Portugal eastward to China in the breeding season, migrating to the tropics for the winter. It frequents mountains and rocky river-banks among hills, but does not ascend to Alpine regions. It builds in niches of the rocks a large, open-topped nest of mud, occasionally (as in the villages of the Pyrenees) placing this on the timbers of buildings or among ruins, and lays profusely speckled eggs. "The general color of the adult bird is a light ashy brown above, the lower parts being creamy buff, and the tail-feathers are dark brown, the central and outer pairs being conspicuously spotted with white." Consult Sharpe and Wyatt, *Monograph of the Hirundinidae* (London, 1885-94).

CRAIG, KRÄG, SIR JAMES HENRY (1748-1812). An English soldier, born in Gibraltar. In 1763 he was gazetted an ensign, and in 1771 was appointed captain in the Forty-seventh Foot. He accompanied his regiment to America, fought and was wounded at Bunker Hill, in 1776 was transferred to Canada, and in 1777 was present at the capture of Fort Mifflin. During the earlier part of General Burgoyne's advance upon Saratoga he so distinguished himself as to be intrusted by that commander with dispatches to England. He was promoted to be major in the Eighty-second, proceeded to Nova Scotia, and in 1781 served under Lord Cornwallis in North Carolina. In 1795, having then risen to the rank of major-general, he was placed in command of the expedition against the Dutch colony at the Cape of Good Hope. Aided by Rear-Admiral Elphinstone and Major-General Clarke, he obtained the surrender of the colony on September 14. He went in 1797 to India; and in 1805, as a local general in the Mediterranean, landed with 7000 troops at Castellumare, with orders to cooperate with the Russian forces under General Lacy in an attack upon the French army. After Austerlitz he prudently withdrew to Sicily. In 1807 he was appointed Governor-General of Canada, a post rendered difficult by reason of the French-Canadian hatred of British dominion. After a somewhat vexed administration he resigned in 1811, and was in 1812 promoted to be general.

CRAIG, JOHN (1512-1600). A preacher of the Scottish Reformation. He was born in Aberdeenshire, and educated at Saint Andrews. He entered the Dominican Order, but soon fell under the suspicion of heresy, and was cast into prison. On his release (1536) he traveled on the Continent, and after some time was, through Cardinal Pole's influence, made novice-master in the Dominican convent at Bologna, and later was rector. While here Calvin's *Institutes* fell in his way, and converted him to Protestant doctrines. He was brought before the Inquisition and sentenced to be burnt—a fate from which he was saved by the mob, on the death of Pope Paul IV., breaking open the prisons of Rome. Craig escaped to Vienna, and obtained favor at the Court of Maximilian II.; but the Pope demanded his surrender as one condemned for heresy. The Emperor, however, instead of complying with the request, gave Craig a safe con-

duct out of Germany. He now returned to Scotland (1560), and was appointed the colleague of John Knox in the parish church of Edinburgh. Thinking the marriage of Queen Mary and Bothwell contrary to the Word of God, he boldly refused to proclaim the bans, but afterwards yielded under protest. In 1572 Craig was sent "to illuminate the dark places" in Forfarshire until 1579, when he was appointed chaplain to King James VI. He now took a leading part in the affairs of the Church, was the compiler of part of the *Second Book of Discipline*, and the writer of the national covenant signed in 1580 by the King and his household. He was a man of great conscientiousness, and was not slow to oppose the proceedings of the Court when he deemed them contrary to Scripture, and to speak wholesome but unpleasant truths to majesty itself. He died December 12, 1600. Consult the black-letter facsimile reprint of Craig's *Catechisms* (Edinburgh, 1885), with introduction by T. Graves Law.

CRAIG, Sir THOMAS (1538-1608). A Scottish lawyer, author, and poet. Educated at Saint Andrews and in Paris, he passed as advocate at the Scottish bar in February, 1563, and was appointed justice-depute. He gained the favor of James VI., who, notwithstanding his modest and persistent refusal, created him a knight in 1603. Besides some much-admired Latin verse and prose, he wrote *Jus Feudale* (ed. Burnet, 1655; new ed., with notes and corrections by James Baillie, 1766). This learned work is still an authority on feudal law.

CRAIGENGELT, krā'gen-gēlt', CAPTAIN. In Scott's *Bride of Lammermoor*, a bully and adventurer, the friend of the Laird of Bucklaw, Frank Hayston.

CRAIGENPUTTOCK, krā'gen-put'tūk. A farm in the southwestern part of Dumfriesshire, Scotland, situated 12 miles north of Castle Douglas, and celebrated as the residence of Thomas Carlyle. It belonged to Jane Welsh before her marriage to the author. The Carlyles lived there most of the time between 1828 and 1834. Much of Carlyle's writing was done at Craigenputtock, and there are frequent references to it in his published correspondence. Consult "Homes and Haunts of Carlyle," in *Westminster Gazette* (London, 1895).

CRAIGHILL, krā'gīl. **WILLIAM PRICE** (1833—). An American military engineer, born at Charlestown, Va. He graduated in 1853 at the United States Military Academy; in 1854-55 superintended the building of Fort Sumter, and in 1858 that of Fort Delaware, and was for several years an instructor at the Academy. In 1863 he constructed the defenses of Pittsburg, and in 1865 was brevetted a lieutenant-colonel for service in the defense of Cumberland Gap. He was promoted to the rank of major, and from 1865 to 1867 was in charge of the defenses of Baltimore Harbor. Subsequently he was concerned with several public works, such as the improvement of the Potomac River (1870-74) and the Delaware River (1873). He was chief of engineers of the United States Army, with the rank of brigadier-general, from 1895 until his retirement at his own request in 1897. In 1894-95 he was president of the American Society of Civil Engineers. His publications include an *Army Officer's Pocket Companion* (1862), and

a translation of Dufour's *Cours de tactique* (1863).

CRAIGIE, krā'gē, PEARL RICHARDS. See HOBBS, JOHN OLIVER.

CRAIGLEITH (krā'lēth') **STONE**. A siliceous sandstone belonging to the Carboniferous series, quarried at Craigeleith, near Edinburgh. It is largely used in that city for building purposes, for which it is admirably adapted by its purity, durability, and the ease with which it can be wrought.

CRAIK, krāk, **DINAH MARIA** (1826-87). An English novelist, better known as Miss MULOCH. She was born at Stoke-upon-Trent, Staffordshire. In 1849 she published *The Ogilvies*, her first novel, and rapidly afterwards: *Olive* (1850); *The Head of the Family* (1851); *Alice Learmount* (1852); *Agatha's Husband* (1853); *John Halifax, Gentleman* (1857); *A Life for a Life* (1859); and *Christian's Mistake* (1865); and a great number of short papers. A pension of £50 was granted to her in 1864. In 1865 she married George Lillie Craik. Among her later works is *Sermons Out of Church* (1875). Her literary reputation rests chiefly upon *John Halifax, Gentleman*, a classic picture of middle-class English life, which had a remarkable success, and has appeared in frequent later editions. Some of her *Poems of Thirty Years, New and Old* (1881), such as "Douglas" and "Philip, my King," have been popular.

CRAIK, GEORGE LILLIE (1798-1866). An English miscellaneous writer. He was born at Kennoway, Fifeshire, and was educated for the Church at Saint Andrews University; but, preferring a literary career, he went to London in 1826. His first work of importance was the *Pursuit of Knowledge Under Difficulties* (1830-31), forming part of the series of publications issued by the Society for the Diffusion of Useful Knowledge. He also contributed largely to the *Penny Magazine* and the *Penny Cyclopædia*. In 1837 Craik became editor of the *Pictorial History of England*, some of the most valuable chapters of which were written by himself, and afterwards enlarged and republished separately as independent works. Such are his sketches of the *History of Literature and Learning in England from the Norman Conquest to the Present Time* (1844-45), and his *History of British Commerce* (1844). In 1845 he published *Spenser and His Poetry*, and in 1846-47 *Bacon and His Writings*. In 1849 Craik was appointed to the chair of history and English literature in Queen's College, Belfast, a situation which he occupied till his death. In 1848-50 appeared his *Romance of the Peccage*; in 1851 his *Outlines of the History of the English Language*, which has passed through various editions; and in 1856 his essays on *The English of Shakespeare*, which passed through several editions. He possessed an energetic mind, his thinking was clear, and he was careful in his statement of facts.

CRAIK, JAMES (1731-1814). The favorite physician of George Washington. He was born in Scotland. He accompanied Washington in the Braddock expedition, and subsequently entered the medical service of the Revolutionary Army, and was director of the hospital at Yorktown. He was active in the disclosure of the plot to remove Washington from command during the winter at Valley Forge (see CONWAY,

THOMAS), and was present at the surrender of Lord Cornwallis at Yorktown. After the war he settled near Mount Vernon, and attended Washington in his last illness.

CRAIK, ROBERT (1829—). A Canadian physician, born in Montreal. He studied medicine at McGill University, and in 1854 became connected with the general hospital in Montreal. In 1856 he was appointed demonstrator of anatomy at the university, and three years later was made curator of its anatomical museum. From 1860 to 1867 he held the chair of clinical surgery at the university. Meanwhile, in 1866, he was called upon to substitute for the professor of chemistry while continuing his lectures in clinical surgery, and in 1867 he decided to resign the chair of surgery and retain that of chemistry. He resigned the latter chair in 1879, but in 1889 was elected dean of the medical faculty and professor of hygiene and public health.

CRAILSHEIM, or KRAILSHEIM, kriłz'him. A town of Württemberg, Germany, on the Jagst, 47 miles northeast of Stuttgart. Its municipal offices are situated in the ancient castle of the Hohenlohes; the fifteenth-century Church of Saint John, a Gothic edifice, contains some good paintings and other interesting features, and there is a fine Rathaus. It has considerable trade, and manufactures of woollens and cement. Population, in 1900, 5255.

CRAIOVA, or KRAJOVA, kri-ō'vā. The capital of the Province of Craiova, Rumania, 112 miles west of Bucharest. It is the centre of a rich agricultural and forest region, and has considerable trade in timber, agricultural produce, and cattle. Salt is extensively mined in the neighborhood. It is a garrison town, and has large governmental industrial establishments for the manufacture of leather, rope, and carriages. In the Middle Ages it was the residence of a ban and the capital of Lower Wallachia. Population, in 1899, 45,438.

CRAKE, or CORN-CRAKE (from Icel. *kraka*, crow, so named from its cry). An English name for the land-rail (*Crex crex*), formed in imitation of its familiar cry, 'erek, erek,' which is heard from every field of grain in valleys and low grounds in Great Britain in early summer, and is associated with all that is pleasant in that pleasant season. It is a very pretty bird, of a reddish-brown color, marked with dark brown in streaks along the middle of the feathers, lighter below. (See Plate of RAILS, ETC.) Several other similar short-billed rails of the genera *Crex* and *Porzana* are often termed crakes, as the spotted crane (*Porzana porzana*), which is smaller than the corn-crake and is very similar to the American sora.

CRAKE, AUGUSTUS DAVID (1836-90). An English author. He was educated at London University, entered the ministry of the Church of England, and after holding pastorates at Bloxham and in the Isle of Wight, became Vicar of Cholsey, near Wallingford, in 1885, where he remained until his death. He was the author of a number of devotional books and of a long series of historical story-books, illustrating the history of the Church in England. His works include: *Emilius* (1871); *Evanus* (1872); *Edwy the Fair* (1874); *Alfgar the Dane* (1874); *Fairleigh Hall* (1882); *The Last Abbot of Glastonbury* (1884); *Yule-Log Stories* (1887); *Stories from*

Old English History (1887). His best-known historical work is a *History of the Church Under the Roman Empire* (1873).

CRAKEBERRY. See CROWBERRY.

CRAMER, krā'nēr, GABRIEL (1704-52). A Swiss mathematician. He was born in Geneva, and was subsequently professor of mathematics there. His chief work is a treatise on algebraic curves (Geneva, 1750); but he contributed to the subject of equations (q.v.), revived the study of determinants (q.v.), which had been begun by Leibnitz, and wrote on the physical cause of the spheroidal shape of the planets and the motion of their apses (Paris, 1730). He also edited the works of Johann Bernoulli (4 vols., Lausanne, 1742) and Jakob Bernoulli (2 vols., Geneva, 1744). In his investigation of curves Cramer generalized the problem of Pappus, to inscribe in a given circle a triangle whose sides produced shall pass through three collinear points; proved Newton's rule for determining the infinite branches of a curve; and completed the classification of cubic curves. Consult: Cantor, *Geschichte der Mathematik* (Leipzig, 1898), and Muir, *Theory of Determinants in the Historical Order of Development* (London, 1890). See CURVES.

CRAMER, JOHANN ANDREAS (1723-88). A German preacher and poet, born in Jöhstadt, Saxony. He studied theology in Leipzig, and in 1750 became chief Court preacher in Quedlinburg. In 1754 the influence of his friends Klopstock and Bernstorff secured for him an appointment to a similar position in Copenhagen, where he also became professor of theology. Owing to the antagonism of Struensee, he was subsequently banished from the country, and accepted an appointment as superintendent in Lübeck, whence he was recalled to Denmark after Struensee's execution in 1772, and appointed professor of theology and chancellor at the University of Kiel (1774). As a preacher he was unexcelled in his day, and his odes and hymns were very popular. Many of them, such as *Er ist gekommen her, Dein bin ich, Herr*, and *Der Herr ist Gott und Keiner mehr*, are still frequently sung in the Protestant churches of Germany. His collected poems were published under the respective titles, *Sämtliche Gedichte* (1782) and *Hinterlassene Gedichte* (1791).

CRAMER, JOHANN BAPTIST (1771-1858). A German pianist and composer. He was born in Mannheim, but in his infancy went to London with his father, the violinist Wilhelm Cramer, who was also his first teacher. Having completed his studies under Clementi, he appeared in public with great success at the age of seventeen, and after a concert tour in 1788-91, settled in London as a teacher. He repeatedly traveled on the Continent, and from 1832 lived in Paris, whence he returned to London in 1845. He was much admired as a pianist for his correct technique and sympathetic interpretation; his numerous compositions for the pianoforte are now antiquated, with the exception of the *Eighty-Four Studies, Op. 50*, which in their rare combination of superior technical requirements with the highest musical value have become an accepted classic, and are used in the entire musical world as models of fundamental studies for the acquirement of solid and tasteful pianoforte playing.

CRA'MER, JOHN ANTONY (1793-1848). An English philologist, born at Miltödi, Switzerland, of German parentage, and educated at Christ Church, Oxford. He was professor of modern history at Oxford from 1842 until his death, and during the last four years of his life was also Dean of Carlisle. The following are a few of his principal works: *Dissertation on the Passage of Hannibal Over the Alps* (in collaboration with H. L. Wickham; 2d ed., 1828); *Anecdota Græca e Codicibus Manuscriptis Bibliothecarum Orontisium Descripta* (4 vols., 1835-37); *Cæteræ Græcorum Patrum in Novum Testamentum* (8 vols., 1838-41).

CRA'MER, krä'mër, KARL EDUARD (1831-1901). A Swiss botanist, born in Zurich. He studied there and in Freiburg, taught for several years at the technological institute of Zurich, and in 1861 was appointed professor of botany at the Polytechnikum. In 1882 he was made director of the botanic garden in Zurich. His published works include the following: *Pflanzenphysiologische Untersuchungen*, jointly with Nägeli (1855-58); *Untersuchungen über die Ceramieccen* (1863); *Bildungsabweichungen bei einigen wichtigeren Pflanzenfamilien* (1864). He was also the author of a number of important monographs on botanical subjects, published in scientific periodicals.

CRAMP (OHG. *chrampfa*, Ger. *Krampe*, *cramp*, from OHG. *krampf*, curved, Icel. *krapp*, narrow; connected also with AS. OS. *crumb*, OHG. *krump*, Ger. *krumm*, crooked). An irregular, involuntary, and generally painful contraction of a voluntary muscle, without insensibility or other disturbance of the general system. Cramp is often the effect of cold, and has proved fatal to swimmers by attacking them suddenly when in the water. It is readily removed by warmth and friction, when due to a strained position, to cold, or prolonged contraction of a group of muscles, as in lifting a weight above the head. A swimmer attacked with cramp in the legs should turn on his back and, while floating, grasp and knead the affected muscles violently. Cramps are a distressing symptom in cholera (q.v.). They occur in colic (q.v.), in tetanus (q.v.), and in some cases of poisoning. Writers' cramp is an 'occupation neurosis' (q.v.) consisting of a spasmodic closure of the hand on attempting to write, which turns the pen over and prevents its moving. Telegraphers, brakemen on railroads, ballet-dancers, cigar-makers, and many others suffer from a cramp in the group of muscles which they use constantly in their occupations.

CRAMP, CHARLES HENRY (1828—). An American ship-builder, born in Philadelphia. He became a partner in, and later president of, the Cramp Ship-building Company. In the latter capacity he assisted in the reconstruction of the United States Navy, and the reestablishment of the United States merchant marine. The sunken battle-ship *Maine*, which was destroyed in Havana harbor on February 15, 1898, was built at the Cramp yards, in whose thirty-one acres of ground nearly 6000 workmen are employed.

CRAMP'EL, krän'pèl', PAUL (1863-91). A French traveler in Africa. He first went to the French Congo in 1886 as secretary to Savorgnan de Brazza, and in 1888-89 conducted most successfully an expedition from the Ogowe River

into the Fan country north and back to Corisco Bay. In the following year he was commissioned by the Comité de l'Afrique Française to penetrate to Lake Chad, and started from Stanley Pool with a small force of 30 Senegalese soldiers and 250 carriers, and accompanied by three Europeans. Having marched under great difficulties from Bangui on the Ubangi River northward to El Kuti, he was abandoned by his carriers, and while trying to force their way farther north, he and his remaining companions were surprised and massacred by the Semssi Moslems. Only one European escaped to bring the news to the Congo (July, 1891).

CRAMP'FISH (so called from the temporary paralysis caused by its shock). The electric ray. See TORPEDO.

CRAMP'TON, CHARLES ALBERT (1858—). An American chemist, born at Davenport, Iowa. He received his education at the University of Michigan, became assistant chemist in the United States Department of Agriculture in 1883, and, seven years later, was made chief chemist to the Internal Revenue Bureau. He carried out a number of interesting investigations in agricultural chemistry and published numerous memoirs and reports on special topics of the chemistry of food and agricultural products.

CRAMP'TON, THOMAS RUSSELL (1816-88). An English railway engineer. He was born in Kent and was educated by private tutors. Entering the engineering profession, he early turned his attention to locomotive and railway building. In 1843 he designed and patented the locomotive that is still known by his name, and which won him the cross of the French Legion of Honor from Napoleon III. in 1855. His best-known work was the successful laying of the telegraphic cable from Dover to Calais in 1851. He also constructed the Smyrna Railway, the Varna Railroad in Bulgaria, various lines in England, and the Berlin Water-Works.

CRANACH, krän'ác, LUCAS (1472-1553). A German painter, born in Upper Franconia. There is much dispute in regard to his family name, but it has been conclusively shown by Schuchardt, on Cranach's own testimony, that it was Müller. Cranach was a pupil of his father, and in 1504 became Court painter to Frederick the Wise, Elector of Saxony, at Wittenberg, by whom he was held in high repute. His office included the duties of master of ceremonies at Court, and besides this he found time for different business ventures at Wittenberg. In 1519 he was elected chairman of the town council; he became burgo-master in 1537, and again in 1540. Cranach was in equal favor with the two following Electors of Saxony, and for two years remained with John Frederick during his imprisonment. He died at Weimar, October 16, 1553.

Cranach has been called the painter of the Reformation, because of his active part in spreading its doctrines. This he did by means of paintings and woodcuts ridiculing the Pope and explaining the teachings of the Reformers, and by his numerous portraits of Luther and Melancthon, who were both his personal friends. Because of this activity and also on account of his great productiveness, he became the controlling influence in the art of middle and northern Germany, and founded what may be called the

CRANBERRY ETC.



1. COSMOS (*Cosmos tenuifolius*).
2. CRANBERRY (*Vaccinium macrocarpon*).
3. COREOPSIS (*Coreopsis lanceolata*).

4. CORN COCKLE (*Lychnis githago*).
5. COWSLIP (*Primula veris*).
6. SUNN HEMP (*Crotalaria juncea*).

Saxon School. He painted with great facility—in fact, the inscription upon his gravestone gives him the title of 'celerrimus pictor.' His early paintings were carefully executed, but in later life he did much negligent work. He paid great attention to detail, for which reason his smaller pictures were more attractive. His color was bright and clear, but his drawing was deficient, and he failed utterly whenever he attempted to represent the nude on a large scale. His work was always original, and though we see the influence of the Renaissance in his mythological subjects, his art was thoroughly German and national. It was, moreover, naïf and rich in fantasy, being best wherever there was a chance for genre.

Cranach's works survive in large numbers, especially in the German galleries. But he intrusted so much to his large school of pupils that it is difficult to decide how much is actually due to him. Among his best works are the "Repose in Egypt" (1504), now in Leipzig; "Christ Blessing the Children," in the Baring collection in London; "Samson and Delilah," in the Museum of Augsburg, and the "Fountain of Youth," in the Berlin Museum. All of these pictures possess a charming naïveté. Of his larger religious paintings, good examples are the "Marriage of Saint Catherine," in the Cathedral of Erfurt, of his earliest period, and his last great work, the "Crucifixion," in the town church of Weimar. This depicts the object of the Reformation, quaintly introducing the figures of Luther and of Cranach himself. His best works are probably his portraits, for in these the detailed execution is more appropriate. But even here he falls far short of the strength of character of Dürer and Holbein. Among the best are "Cardinal Albrecht of Mainz as Saint Jerome," in the Berlin Museum; John Frederick of Saxony, in Dresden; and an "Unknown Female" (No. 291), in the National Gallery, London. His oft-repeated portraits of Luther and Melancthon exercised a very great influence in spreading the Reformation. Cranach was also an excellent painter of miniatures, as may be seen in the album of the University of Wittenberg, now at Halle, and especially in John Frederick's "Book of Tourneys," now at Coburg, a work of 144 leaves. He also executed a few copper plates and a large number of drawings for woodcuts.

Consult: Kugler, *German, Flemish, and Dutch Schools* (Eng. trans., London, 1898); Schuchardt, *Cranach des älteren Leben und Werke* (Leipzig, 1855-71); Warnecke, *Cranach der ältere* (Görlitz, 1879); Lindau, *Lucas Cranach* (Leipzig, 1883).

CRANACH, LUCAS (1515-86), the younger. A German painter, the second son and pupil of the preceding. His works are hard to distinguish from his father's, and are often assigned to him. His coloring is heavier than his father's and his drawing is worse. A number of his works survive in Dresden, Leipzig, Weimar, and Wittenberg.

CRANBERRY (from *crane* + *berry*). A name given to the fruit of a few creeping, vine-like species of the genus *Vaccinium*, family Ericaceæ. The smaller cranberry (*Vaccinium oxycoccus*) grows wild in the peaty bogs and marsh lands of the temperate and colder regions of both Europe and America. The larger cran-

berry (*Vaccinium macrocarpon*) is native in similar situations in the United States, and is extensively cultivated for commercial purposes in Massachusetts, New Jersey, Wisconsin, and a few other Northern States. The cranberry is a firm, red, acid berry, of good keeping quality, and is used for sauce, tarts, and the like. In the improved commercial culture of cranberries, natural swamps or bogs are selected which can be drained by open ditches and flooded when desired. The native moss and swamp growth are removed, and the peat covered two to four inches deep with sand. The vines are planted about 14 inches apart, cuttings 6 to 8 inches in length being used. The sand keeps down the weeds, makes cultivation easy, and helps retain the moisture in the soil below. Additional sandings are given every four or five years, which keep the vines short and close. In some localities sanding is omitted altogether. The object of flooding is to protect the vines in winter and from early fall and late spring frosts, to destroy insects, prevent drought, and protect against fire. The berries are gathered preferably by hand, but often with special rakes and combs. There are three principal types of cultivated varieties, determined by the form of the berries—bell-shaped, bogle-shaped, and cherry-shaped—with many varieties of each. In 1900, 987,516 bushels of cranberries were marketed in the United States.

The cowberry or mountain cranberry (*Vaccinium vitis-idaea*) is common in both Europe and America, and, like *Vaccinium oxycoccus*, is gathered and sold in considerable quantities, but is not cultivated. The shrub *Viburnum opulus* is known as the high-bush cranberry. The fruit is tart, but is of little value, and is seldom eaten. The Tasmanian cranberry is the fruit of *Astroloma humifusum*, of the natural order Epacridaceæ.

CRANBERRY DISEASES. The scald, or rot, is the most serious fungous trouble of the cranberry, its name being derived from the appearance of the fruit. It is of fungous origin and may be recognized by the occurrence of a soft spot on one side of the berry. The skin becomes tense and of a reddish-brown color. Later the berry becomes shriveled and may or may not fall to the ground. Distinct brownish spots may also be seen on the leaves. The disease is most troublesome in hot, moist seasons, and the most satisfactory treatment, where it can be followed, is to cover the bog with a thin layer of sand, which can best be done when the bog is flooded. This disease has been known to destroy more than half the berries on a bog in a short time. A gall-producing fungus, *Synchytrium vaccinii*, is common on the cranberry and related plants. The presence of the fungus on the leaves and other parts of the plant causes the formation of red galls. Burning over the bog in autumn is recommended as a preventive means, since the spores are ripened the second year. Common and conspicuous malformations of leaves, flowers, and young shoots of the cranberry are due to *Exobasidium vaccinii*. The parts attacked are swollen and the green color replaced by rose or red. When severely attacked, the plants may be so affected as to reduce the crop. But the disease is seldom severe.

CRANBERRY INSECTS. The worst enemies of the cranberry are two moth caterpillars

—the black-headed fire-worm (*Rhopobata vaciniuna*), which defoliates the bushes, and a span-worm (*Acerobasis vaccinii*), which attacks the fruit. For the first, Prof. J. B. Smith, author of a treatise on "Insects Injurious Affecting Cranberries," in *Special Bulletin K, New Jersey Agricultural College Experiment Station* (New Brunswick, N. J., 1890), recommends reflowing the land and application of kerosene or Paris green; for the second, Paris green or London purple applied after the leaves are mostly gone and the berries are set. A scale, a leaf-hopper, and certain locusts and crickets are also harmful.

CRANBROOK, GATHORNE GATHORNE-HARDY, first Earl of (1814—). An English statesman, born at Bradford. He was educated at Oxford, and was appointed Under Secretary of State for the Home Department in 1858, two years after his election to Parliament. In 1865 he was again elected to Parliament as the representative of the University of Oxford, defeating Mr. Gladstone in that electoral contest. In 1867-68 he was Home Secretary, and was subsequently Minister of War (1874-78), Secretary of State for India (1878-80) under Lord Beaconsfield, and Lord Secretary of the Council under the Marquis of Salisbury (1885 and 1886-92). He was raised to the peerage in 1878 as Viscount Cranbrook, and was created Baron Medway in 1892.

CRANCH, CHRISTOPHER PEARSE (1813-92). An American artist and poet, born at Alexandria, Va. He studied theology at Cambridge, Mass., and became a Unitarian clergyman. In 1842 he retired from the ministry. He associated himself with the Transcendentalists, and wrote verse for *The Dial*, but in 1846 went to Europe to study art, remaining there until 1863. He returned to America in 1864; but after 1871 devoted himself wholly to literature, to which he had already contributed *Poems* (1844), two juveniles, *The Last of the Huggermuggers* (1856), and *Kobboltozo* (1857). His later works were a blank verse translation of the *Æneid* (1872); *Satan*, a libretto (1874); *The Bird and the Bell*, with other poems (1875); *Ariel and Caliban* (1887). He was a man of genuine culture, who, growing up in the midst of more gifted spirits, failed to make a deep impression upon his generation. He is probably best remembered for his good stanzas beginning "Thought is deeper than all speech."

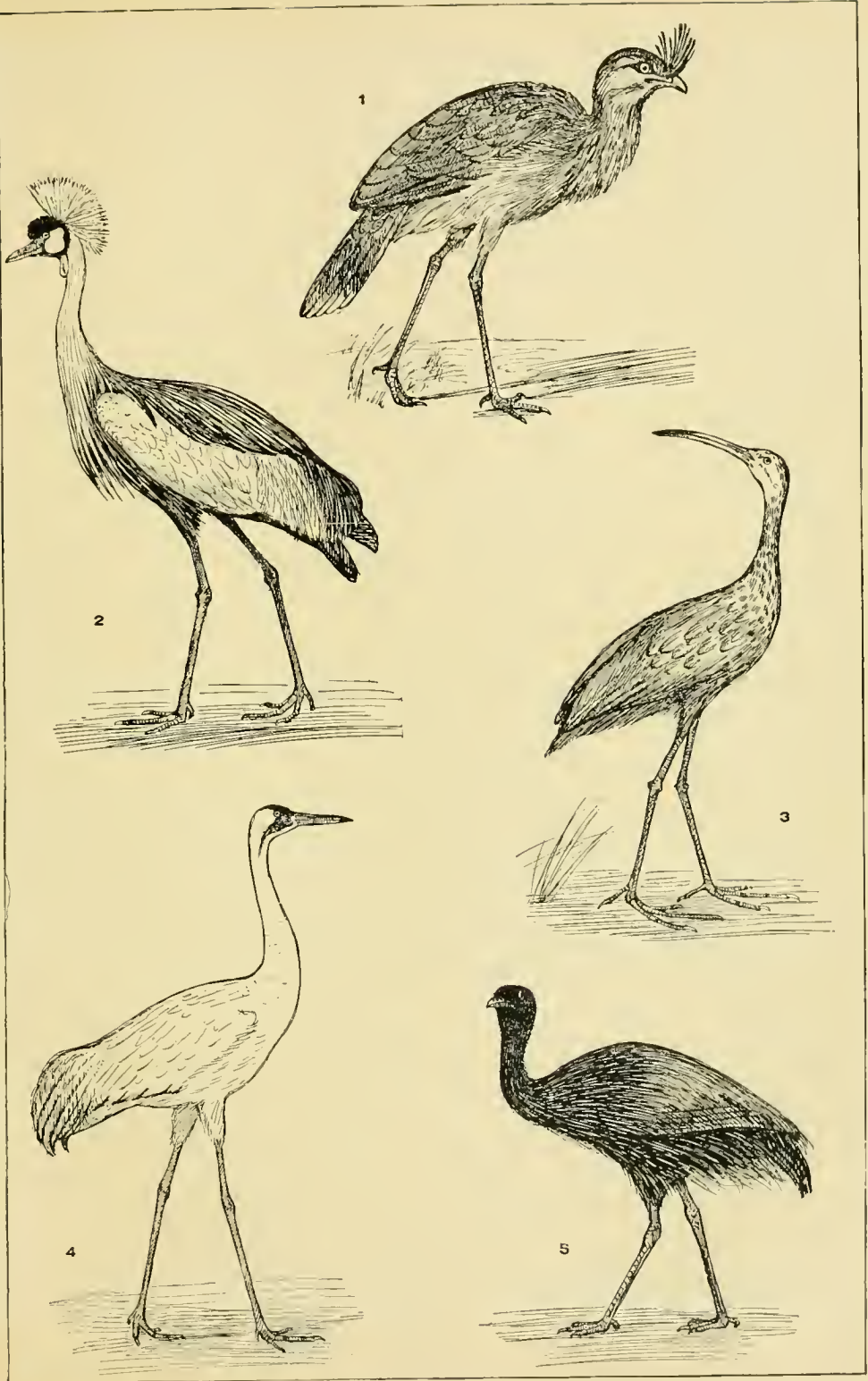
CRANCH, WILLIAM (1769-1855). An American judge, born at Weymouth. He graduated at Harvard, and was admitted to the bar in 1790. In 1801 he was appointed a justice of the United States Circuit Court for the District of Columbia, and in 1805 was made Chief Justice, which position he held until his death. He published: *Reports of Cases in the United States District Court of the District of Columbia* (1801-41); and the *Supreme Court Reports* (1800-15).

CRANDALL (PHILLEO), PRUDENCE (1803-90). An American educator and philanthropist. She was born at Hopkinton, R. I., of Quaker parentage; was educated at the Friends' School in Providence, R. I.; taught for a time at Plainfield, Conn., and in 1831 established a private school for girls in Canterbury. Early in 1833 she admitted a colored girl into the school, and thereby aroused the violent opposition of her neighbors. This led her to abandon her original

plan, and to open her school unreservedly to "young ladies and little misses of color." Accordingly she issued an announcement to that effect in the *Liberator* of March 2, and early in April received fifteen or twenty colored pupils. Her neighbors then began a systematic course of persecution, and endeavored by boycott, insult, and abuse, and by enforcement of an obsolete vagrancy law, to break up the school. Public meetings were called, petitions were circulated, and on May 24 the celebrated 'Black Law' of Connecticut was passed forbidding any one to "set up or establish in this State any school, academy, or literary institution for the instruction or education of colored persons who are not inhabitants of this State," or to instruct or teach in any such school. For refusing to obey this law Miss Crandall was arrested, was imprisoned in the Canterbury jail, and in October was convicted, though the Court of Errors reversed the decision of the lower court on a technicality, in July, 1834. Soon afterwards Miss Crandall's house was assaulted and partially destroyed, and she finally decided to abandon her project. The whole affair attracted much attention throughout the country and served to intensify the conflict between the abolitionist and anti-abolitionist elements among the Northern people. A short time after giving up her school Miss Crandall married the Rev. Calvin Philleo, and passed the rest of her life in New York, Illinois, and Kansas. Consult May, *Recollections of the Anti-Slavery Conflict* (Boston, 1869).

CRANE. The largest of the wading birds (Grallæ). They constitute the family Gruidæ, which occupies a very distinctive position between the trumpeters and the rails, being connected with the latter by the limpkins, or Aramidæ. All are tall, long-legged, long-necked birds, with the head more or less naked, but sometimes tufted, rather long, straight, compressed beaks, short but powerful wings, short tails, the feet unwebbed, and the hind toe greatly elevated; they are like herons in appearance, but resemble rails in structure. One remarkable feature is the enormous development of the windpipe within the keel of the breastbone, where it is coiled and twisted before emerging into the neck; the extreme development of this is found in our American whooping crane, where the trachea reaches four or five feet in length in old age (it is perfectly straight and simple at birth), and the convolutions act like those of a French hunting-horn in producing the extraordinary resonance of tone for which the voice of this species (see IBS) is noted. About eighteen species of crane are known, representing three genera and all parts of the world except South America and the Malayan and Polynesian archipelagoes. The best-known, perhaps, is the European crane, which is about four feet high, ashy gray, with a blackish face and throat. The tertial feathers of the wings are so prolonged as to droop over the quills; their webs are fibrous and disconnected, and formerly they were much used as ornamental plumes. This peculiarity characterizes most other species to a greater or less extent, and some species have the power to elevate these plumes at will, forming a striking ornament. All the cranes of the temperate zone migrate, some going annually to the far north to breed; and the coming of flocks in the spring,

CRANES, ETC.



1. SERIEMA (*Seriema cristata*).

2. CROWNED CRANE (*Balearica pavonina*).

3. LIMPKIN (*Aramus pictus*).

4. WHOOPING CRANE (*Grus americana*).

5. TRUMPETER (*Psophia crepitans*).

always in a V-formation, and the extraordinary 'dances' with which some accompany courtship, have been observed for centuries and have caused a large body of myth and folklore to grow up about the bird during classical and mediæval times. On this point, consult C. de Kay, *Bird Gods* (New York, 1898).

The remote breeding of the European crane (*Grus grus*) in Lapland and along the northern border of Russia was little known until the mystery was solved by J. Wolley in 1853, who discovered among other new facts that the young run about as soon as they leave the egg, and that the sitting bird would not carry away eggs that had been handled, as had been commonly believed. The birds make their nests on the ground in the marshy plains that border the Arctic Sea. The whole account (*Ibis*, London, 1859) is exceedingly interesting, and is largely quoted by Stejneger in the *Standard Natural History*, vol. iv. (Boston, 1885). Other cranes of the Old World are the northwest African crowned or Balearic crane (*Balearica pavonina*), which has a top-knot like that of a peacock; and the smaller Numidian crane or demoiselle (*Grus virgo*), which in summer resides and breeds from Turkey eastward to China, and which is the one most famous for its dancing. The Manchurian crane (*Grus viridirostris*) is especially common in winter in Korea, where it is trapped in large numbers and sold to the Chinese and Japanese, who are especially fond of it, and endow it with many folklore qualities. The large Australasian crane (*Grus australasiana*) is one of the most conspicuous birds of that region, and is known to the Australians as 'native companion' because of its friendly disposition. It will sometimes follow the plowman, picking up the insects he turns out of the soil. Consult Blyth, *Natural History of the Cranes* (London, 1881).

American cranes are of three species. The greatest is the whooping crane (*Grus americana*), which is larger than the European crane, and is seldom seen except on the Western plains, where it has become rare. Two others are also species of the Western interior, and are diminishing in numbers: one is the sand-hill crane (*Grus mexicana*), and the other the little brown crane (*Grus canadensis*)—both until recently regarded as one species. Consult Coues, *Birds of the Northwest* (Washington, 1874). See Plate of CRANES, ETC.

CRANE (AS. *cran*, *cornoch*, OIG. *cranuh*, *chranih*, Ger. *Kranich*, crane; connected with Welsh, Corn., Bret. *garan*, OChurch Slav. *zherari*, Lith. *gérve*, Gk. *γέρανος*, *geranos*, crane; so called from the resemblance of the arm of the machine to the neck of the bird). A term used in mechanics to designate a hoist which can also move the load in a horizontal or lateral direction. Cranes are divided into two classes, as to their motions—viz. rotary and rectilinear—and into four groups as to their motive power—viz. hand, when operated by manual power; power, when driven by power derived from line shafting; steam, electric, hydraulic, or pneumatic, when driven by an engine or motor attached to the crane, and operated by steam, electricity, water, or air transmitted to the crane from a fixed source of supply; locomotive, when the crane is provided with its own boiler or other generator of power, and is self-propelling, usually being capable of both rotary and recti-

linear motion. Rotary and rectilinear cranes are thus subdivided: (1) Swing cranes, having rotation but no trolley motion; (2) jib cranes, having rotation and a trolley traveling on the horizontal jib; (3) column cranes, identical with the jib crane, but rotating around a fixed column, which usually supports a floor or roof above; (4) derrick cranes, identical with jib cranes, except that the head of the mast is held in position by guy rods, instead of by attachment to a roof or ceiling; (5) pillar cranes, having rotation only, the pillar or column being supported entirely from the foundations; (6) pillar jib cranes, identical with the last, except in having a jib and trolley motion; (7) walking cranes, consisting of a pillar or jib crane mounted on wheels and arranged to travel longitudinally upon one or more rails; (8) locomotive cranes, consisting of a pillar crane mounted on a truck, and provided with a steam-engine capable of propelling and rotating the crane, and of hoisting and lowering the load; (9) bridge cranes, having a fixed bridge spanning an opening and a trolley moving across the bridge; (10) tram cranes, consisting of a trunk or short bridge, traveling longitudinally on overhead rails and without trolley motion; (11) traveling cranes, consisting of a bridge, traveling longitudinally on overhead tracks, and a trolley moving transversely on the bridge; (12) gantries, consisting of an overhead bridge carried at each end by a trestle traveling on longitudinal tracks on the ground, and having a trolley moving on the bridge; (13) rotary bridge cranes, combining rotary and rectilinear movements and consisting of a bridge pivoted at one end to a central pin or post and supported at the other end on a circular truck, provided with a trolley moving on the bridge.

Cranes are built of wood and iron, but at the present time cast iron and steel are employed nearly exclusively. Hand cranes are employed for handling comparatively light loads, and the manual power is usually applied by means of a crank or cranks operating a windlass, around the drum of which the hoisting rope is wound and unwound. For heavy loads some form of mechanical power is always employed, which is applied through a suitable train of mechanism for performing the various movements of hoisting, rotation, and horizontal travel. A great variety of such mechanisms are in common use for each of the principal kinds of motive power, and for details the reader should consult special treatises on hoisting machinery. Cranes are built with capacities of from a few hundred pounds to as much as 150 tons. The traveling crane in the 12-inch gun shop at the Washington Navy-yard has a capacity of 150 tons; the span of the bridge is 59½ feet; the maximum travel of the trolley lengthwise of the bridge is 44 feet 2 inches, and its traveling speed is from 25 to 50 feet per minute; the effective lift is 40 feet, with four speeds of hoist; the speed of travel of the bridge is from 30 to 60 feet per minute.

The Finnisston Quay, at Glasgow, Scotland, is equipped with a pillar crane of 150 tons capacity. The jib is formed of two steel tubes, each 39 inches in diameter and 90 feet long; the radius of sweep for heavy lifts is 65 feet; the jib and its load are counterbalanced by a weight of 100 tons; and in a test a 130-ton load was lifted at a rate of 4 feet per minute, and a complete

revolution was made with this load in five minutes. The floating crane at Cramp's shipyard, in Philadelphia, Pa., has a steel mast 116 feet high and 3 feet in diameter, carrying a horizontal jib 65 feet long with a counterbalance arm 50 feet long which is stayed to the bottom of the mast and to the hull of the barge. The barge is 69 feet long, 62 feet wide, and 13 feet deep. This crane has a lifting capacity of 125 tons. A floating crane owned by the Chapman Wrecking Company, of New York City, has a mast 92 feet high and a jib 98 feet long, and is capable of lifting a load of 265 tons.

On board ship cranes are fitted for handling cargo, coal, boats, anchor, etc. The boat-crane of a large modern man-of-war is built up, box-girder fashion; it rises 20 or 25 feet above the skid-beams on which the boats are stowed, and the horizontal arm extends 10 or 15 feet beyond the ship's side when turned out for the purpose of lowering or hoisting a boat. The power is either electricity or steam, and serves to hoist and lower the boat, run it in or out on the horizontal arm of the crane, or train (i.e. turn horizontally) the latter. Consult: Glynn, *Treatise on the Construction of Cranes and Other Hoisting Machinery* (London, 1887); Marks, *Notes on the Construction of Cranes and Lifting Machinery* (London, 1889); and Towne, *A Treatise on Cranes* (New York, 1883). See DER-RICK.

CRANE, BRUCE (1857—). An American artist. He was born in New York, and studied there under A. H. Wyant. His landscapes are frequently exhibited, and he has become famed for his winter and snow studies. Mr. Crane became a member of the National Academy in 1879.

CRANE, ICHABOD. The lanky country school-master, and hero of the adventure with the Headless Horseman, in Washington Irving's "Legend of Sleepy Hollow," in *The Sketch Book*.

CRANE, STEPHEN (1870-1900). An American journalist and novelist, born at Newark, N. J., November 1, 1870. He was educated at Lafayette College and Syracuse University; began active life as a reporter and newspaper writer; was correspondent for the *New York Journal* in the Greco-Turkish War (1897) and in Cuba, and then removed to England. His first essay in fiction was a story of slum life, *Maggie, a Girl of the Streets* (1891). This was followed by a perversely eccentric collection of verses, *The Black Riders and Other Lines* (1895). *The Red Badge of Courage* (1896), a realistic though imaginary presentation of horrors in the Civil War, brought him deserved reputation, and marked the summit of his achievement. Less significant are: *George's Mother* (1896); *The Little Regiment* (1897); *The Open Boat; On Active Service; Whilomville Stories*, and other tales; although in such a short story as *The Master* he showed that he still possessed great power. For some time before his death he resided in England. He died at Badenweiler, Germany, June 5, 1900. Posthumous manuscripts have been collected by his wife under the title *Wounds in the Rain and Great Battles of the World*. Many magazine stories remain uncollected.

CRANE, THOMAS FREDERICK (1844—). An American folklorist and educator, born in New

York City. He graduated in 1864 at Princeton, was appointed professor of modern languages at Cornell, and in 1868 professor of the Romance languages. In 1901 he became dean of the general faculty of the university. He made valuable researches in the history of the development of European folklore, on which subject he accumulated one of the most valuable of extant libraries. His works include: *Italian Popular Tales* (1885); *The Exempla, or Illustrative Stories from the Sermones Vulgares of Jacques de Vitry* (1890); *Chansons populaires de la France* (1891); and *Tableau de la révolution française* (6th ed., 1892).

CRANE, WALTER (1845—). An English painter and engraver, born in Liverpool, August 15, 1845. He was a pupil of his father, Thomas Crane, a portrait painter, and afterwards studied under Linton in London. Among his best oil-paintings are the "Birth of Venus" and the "Fate of Proserpina;" among his aquarelles, "Plato's Garden," "Date Trees on Monte Pincio," and the "End of the Year." He is, however, best known from his illustrations in juvenile works, done in a sort of antique style, mostly in outline. Among the subjects which he has thus treated are "Echoes from Hellas;" "Flora's Feast;" and "Queen Summer." He is also known as a designer for glass windows, tapestries, and the like, and has written extensively upon subjects of general artistic interest. He belongs to the Morris group of Socialists. He has received many medals, is president of the Arts and Crafts Society of London, and is prominently identified with popular art movements in England.

CRANE, WILLIAM HENRY (1845—). An American comedian. He was born in Leicester, Mass., and was educated in the Boston schools. In 1863, after some amateur experience, he made his debut at Utica, N. Y., with the Holman Opera Company, taking the part of the notary in Donizetti's *Daughter of the Regiment*. In 1865 he turned his attention to comedy, and in 1870 became a member of the Alice Oates Company, with which he remained for four years. In 1874 he played at Hooley's Theatre in Chicago, filling the leading comedy rôles, and later he acted in San Francisco for nearly a year. Returning East, he made his first marked success with Stuart Robson (1877), at the Park Theatre, New York City, in Grover's farcical play *Our Boarding House*. Among their other successes were those in the *Comedy of Errors* and *The Henrietta* (1889), after which he separated from Mr. Robson. Since then he has added to his reputation by his excellent work in *The Senator; The American Minister; A Fool of Fortune; A Virginia Courtship* (1898); and *David Harum* (1900). Crane's speciality is eccentric American character.

CRANE-FLY (so called from its long legs). A big, slender-bodied fly of the family Tipulidae, having excessively long, slender legs. These flies appear, often in swarms, in late summer, and about 300 of the thousand or more known species belong to the United States. Their modes of life and reproduction are not well known. "The larvæ of most species," according to Howard, "live in the earth, but some live in water, in decomposing wood, and even upon the leaves of plants. Some of the earth-inhabit-

ing forms destroy grass and grain by injuring the roots. . . . The wings of the crane-flies are generally clear, but are sometimes beautifully marked and spotted." See DADDY-LONG-LEGS.

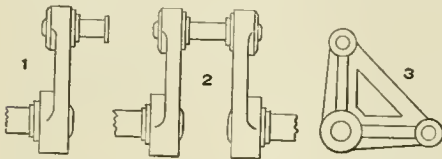
CRANE'S-BILL. See GERANIUM.

CRA'NIAL INDEX. See ANTHROPOMETRY.

CRANIOMETRY (from Gk. *κρανιον*, *kranion*, skull + *μετρον*, *metron*, measure) and **CRANIOL-OGY.** Systematic measurement and comparison of human crania. See ANTHROPOMETRY; MAN, SCIENCE OF.

CRANIUM. See SKULL.

CRANK. A mechanical device consisting of a bend or arm on an axle or shaft by which reciprocating motion is converted into rotary motion. The reciprocating motion of the piston-rod of a steam-engine is converted into rotary motion of the engine-shaft by means of a crank. The crank may consist of an arm on the end of a shaft or of a similarly located disk with a crank-pin, or of a U-shaped bend in the shaft between the ends. The piston-rod transmits its



CRANKS.

1, single crank at end of an axle; 2, double crank in the middle of a shaft; 3, bell crank.

motion to the crank by means of an intermediate connecting-rod. The connecting-rod exercises the maximum force on the crank-arm when this arm is at right angles to the line of motion of the piston-rod, and it exercises no force tending to produce rotation when the crank-arm is parallel to the line of motion of the piston-rod. Maximum force occurs at two points in the rotation of the crank, and no force occurs at two points at right angles to the points of maximum force. The two points of no force are called the dead points; and, in order to carry the crank over these dead points, where only a single connecting-rod is used, the shaft is provided with a heavy fly-wheel, the momentum of which supplies the necessary power to keep up rotation when the connecting-rod is not supplying power. When two connecting-rods are connected with the shaft by separate cranks, the two crank-arms are set at right angles to each other, so that one rod is exerting its maximum force while the other is at the dead points of the revolution.

CRANMER, THOMAS (1489-1556). Reformer of the English Church, and the first Protestant Archbishop of Canterbury. He was born at Aslaeton, in the county of Nottingham, on July 2, 1489. In his fourteenth year he went to Jesus College, Cambridge, of which he was elected a fellow in 1510, but lost his position temporarily by marriage, being reelected on his wife's death. In 1523 he took his degree of D.D., and was appointed lecturer on theology. In 1529, during the prevalence of the sweating sickness in Cambridge, he retired with two pupils to Waltham Abbey; and Henry VIII., in company with Gardiner and Fox, afterwards

bishops of Winchester and Hereford, happening to be in the neighborhood, the event proved a turning-point in the life of Cranmer. The King was then taking steps to secure his divorce from Catharine of Aragon, and, in conversation on the subject with Gardiner and Fox, Cranmer suggested that if the universities could be induced to declare that, in their opinion, the first marriage was unlawful, the King would be free to marry again. Henry was greatly pleased with this idea, and "swore by the Mother of God, that man hath the right sow by the ear." Cranmer was asked to reduce his suggestion to writing, and to have it submitted to the European universities. After this he was appointed Archdeacon of Taunton, and one of the royal chaplains. He was also sent to Rome on a special embassy in the matter of the divorce, but met with little success. Subsequently he was dispatched to the Emperor Charles V. on the same errand; and while in Germany he married a second time, a niece of the German divine Osiander. Shortly afterwards, on the death of Archbishop Warham, he was recalled to fill the vacant see of Canterbury. He was consecrated archbishop March 30, 1533. Under his auspices Henry's divorce was speedily carried through the Archbishop's Court at Dunstable, and on May 28 he announced the legality of the King's marriage to Anne Boleyn, which had taken place four months before. In Anne's subsequent disgrace, and again in the affair of Anne of Cleves, the Archbishop took a part not very creditable to him. His position was no doubt a difficult one; but his character was naturally pliable and timid, rather than resolved and consistent. The same spirit characterizes the measures of religious reform which were promoted by him. On the one hand he joined actively with Henry in restricting the power of the Pope, though he seems to have had less to do with suppressing the monasteries; but, on the other hand, he was no less active in persecuting men like Frith, Forrest, and others, who, on matters of religious faith, were disposed to advance further than himself or the King. He did what he could, however, to resist the reactionary movement which took place in 1539, and which is known by the institution of the *six articles*. He was also instrumental in promoting the translation and circulation of the Scriptures. On Henry VIII.'s death Cranmer was appointed one of the regents of the kingdom, and, along with Latimer and others, largely contributed to the advance of the Protestant cause during the reign of Edward VI. He assisted in the compilation of the service-book and the articles of religion. The latter are said to have been chiefly composed by him. He was also the author of four of the homilies.

On the accession of Mary he was committed to the Tower, together with Latimer and Ridley. In March, 1554, they were removed to Oxford and confined there in the common prison, called the Bocardo. Latimer and Ridley bore their cruel fate with magnanimous courage; but the spirit and principles of Cranmer temporarily gave way under the severity of his sufferings. He was induced to sign no fewer than seven recantations, though there is no ground for supposing that a hope of pardon was held out to him. On March 21, 1556, he suffered martyrdom, as his fellow-reformers had done, opposite

Balliol College. His courage returned at the end, and he showed an unexpected fortitude in the midst of the flames.

Cranmer's principal writings have been edited by Jenkyns, *Remains of Archbishop Cranmer* (Oxford, 1833), and by Cox, for the Parker Society, under the titles *Writings and Disputations Relative to the Lord's Supper* (Cambridge, 1844) and *Miscellaneous Writings and Letters* (Cambridge, 1846). Additional material is to be found in the appendix of Strype, *Memorials of Thomas Cranmer* (Oxford, 1848-54), and his *Ecclesiastical Memorials* (Oxford, 1822); in Nichols, *Narratives of the Reformation*, Camden Society, from the papers of John Foxe (London, 1859); but above all in Brewer and Gairdner, *Calendars of Letters and Papers, Foreign and Domestic, of the Reign of Henry VIII.* (London, 1862-80). Among older works, consult: Foxe, *Acts and Monuments* (London, 1877); Burnet, *History of the Reformation* (New York, 1842); and the *Lives* by Todd (London, 1861) and Le Bas (London, 1833). More recent works are: Dean Hook, "Thomas Cranmer," in his *Lives of the Archbishops*, New Series (London, 1868); Green, *History of the English People*, vol. ii. (New York, 1879); Lingard, *History of England*, vol. v. (London, 1854); and Froude, *History of England*, vols. i.-vi. (New York, 1870).

CRAN'NOGS, or CRANNOGES (Ir. *crannog*, Gael. *crannag*, pulpit, top of a mast, from Ir. Gael. *cram*, tree, Welsh *prenn*, Corn. *preu*, tree; probably connected with Gk. *κράνον*, *kranon*. Lat. *cornus*, cornel-tree, Lith. *kirna*, OPruss. *kirno*, shrub). Ancient lake-dwellings of Ireland and Scotland. Usually the dwellings were extended into villages, often occupying islands; they were analogous to the lake-dwellings (q.v.) or palafittes of Switzerland, and to types of structure still existing in various regions. Commonly they were supported wholly or in part on piles set in the lake bottom, and were connected by platforms. The type persisted in Ireland from an early prehistoric period, when stone implements were used, until the present millennium. The later examples were built by means of bronze and even iron tools, which are sometimes found in the ruins. The refuse heaps below the ancient structures are rich sources of relics, indicating the industrial and artistic status of the builders, their food habits, domestic and game animals, etc. Historical references to the structures began with the earliest Irish annals, about the ninth century, and continued until the middle of the seventeenth century. The archaeological survey and excavation of the ruins began in 1839, when Wilde explored a crannog in Lake Lagore, County Meath. Consult: Wilde's *Catalogue of the Museum of the Royal Irish Academy*; Munro's *Lake-Dwellings of Europe*; and *Ancient Scottish Lake-Dwellings, or Crannogs, etc.*

CRAN'STON. A residential town in Providence County, R. I., including several villages; on the New York, New Haven and Hartford Railroad (Map: Rhode Island, C 2). The principal industries are market-gardening, brewing, and the manufacture of cotton and print goods and wire. Within the precincts of the town are four village libraries, State reform schools for boys and girls, and the State prison, almshouse, insane asylum, and workhouse. The government is administered by annual town meetings. Cran-

ston, settled in 1638, was set off from Providence and incorporated in 1754. Population, in 1890, 8099; in 1900, 13,343.

CRANSTON, EARL (1840—). An American Methodist Episcopal bishop, born at Athens, Ohio. After graduating at Ohio University, in his native town, he entered the cavalry service of his State, served from 1862 to 1864, and was advanced to the rank of captain. He was publishing agent of the Methodist Episcopal Church from 1884 to 1896, when he was elected bishop. In 1898 he began a tour, lasting about two years, through China, Japan, and Korea.

CRANSTOUN, HENRY. A character in Sir Walter Scott's *Lay of the Last Minstrel*, who wins the hand of Margaret, daughter of his enemy, the Lady of Branksome, by assuming the guise of William of Deloraine.

CRAN'TOR (Lat., from Gk. *Κράτωρ*, *Krantōr*). A Greek academic philosopher, who lived about B.C. 300. He was born at Soli, in Cilicia, but went to Athens, where he became a pupil of Xenocrates. He was the first commentator on Plato, and wrote, among other works, *Περὶ Πύθωος*, *Peri Penthous*, or a *Treatise on Affliction*, from which Cicero borrowed largely in writing the third book of the *Tusculanae*, and the lost treatise *De Consolatione*. Horace (*Epodes* 1, 2, 4) classes him with Chrysippus as a moral philosopher. Consult Kayser, *Dissertatio de Crantoræ Academicæ*.

CRAN'WORTH. ROBERT MONSEY ROLFE, Baron (1790-1868). An English jurist. He was educated at Cambridge, was called to the bar in 1816, and was a member of Parliament and Solicitor-General from 1832 to 1839, when he became Baron of the Exchequer. In 1851 he was raised to the peerage, and in the following year was chosen Lord Chancellor in Lord Aberdeen's Cabinet. He resigned in 1858, but again occupied the post in 1865-66. He carried through Parliament a bill by which penal servitude was substituted for transportation, and the ticket-of-leave system was put in operation.

CRAPAUD, *krá'pó'*, JEAN, or JOHNNY. An English nickname for a Frenchman, from the popular belief that all Frenchmen were frog-eaters, *crapaud* meaning a frog or toad. The real origin of the term has been found in the arms of the old French kings, which bore three toads, later changed into the *fleurs-de-lis*.

CRAPE (Fr. *crépe*, OF. *crepspe*, crinkled, from Lat. *crispus*, crisp). A thin fabric made of raw silk which has been tightly twisted, without removing the viscous matter with which it is covered when spun by the worm. It is simply woven as a thin gauze, then dressed with a thick solution of gum, which in drying causes the threads partially to untwist, and thus gives a crinkled and rough appearance to the fabric. It is manufactured both in black and colors. Black crape is usually worn as mourning apparel, a use of the material which originated at Bologna, Italy. The Japanese and Chinese crapes are often white, or highly colored, and sometimes are adorned with ornamental designs. Crape-cloth is made to imitate the silk fabric by passing a form of woolen cloth through rollers which impart the crinkled surface.

CRAPE-MYRTLE. See LAGERSTREMIÆ.

CRAPPIE (possibly connected with Fr. *crappe*, crab-fish). A sunfish (*Pomoxys annularis*) of the rivers of the Mississippi Valley and Alleghenies, closely resembling in appearance and habits the calico-bass, and valued as a food-fish. It is distinguished from its congeners chiefly by the S-shaped profile of the head and the duller tone of its greenish hues. Also called 'bachelor,' 'new light,' 'Campbellite,' etc. See Plate of Bass.

CRAPS. A game of chance, played by any number of persons with two dice. The player holding the dice decides the amount to be played for, and this sum may be made up by one or more persons. After the total amount to be played for is made up, the person holding the dice 'shoots.' Should his first throw be two or twelve, it is 'craps,' and he loses; should he shoot seven or eleven, he wins. Should he throw any other number, then he continues to 'shoot' until he throws that number again and wins, or seven and loses.

CRASH'AW, RICHARD (c.1613-49). An English poet. He was the son of a clergyman in the English Church, and was educated at the Charterhouse, and at Cambridge, where he obtained a fellowship in 1637. In 1644 he was ejected from his fellowship by the Parliament for refusing to take the covenant. He went to France, adopted the Roman Catholic faith, and suffered great pecuniary distress, until, through Cowley's influence, he was introduced to Queen Henrietta Maria, who recommended him to Cardinal Palotta at Rome. The cardinal made him an attendant, and afterwards sub-canon in the Church of Our Lady of Loreto. Just after this latter appointment, Crashaw died, August 25, 1649. In 1634 Crashaw published a volume of Latin poems, in which appeared the famous line on the miracle at Cana, *Nympha pudica Deum vidit et erubuit* (The modest water saw its God and blushed). In 1646 appeared a volume of poems in two parts, one containing religious and the other secular poems, under the titles (abbreviated), *Steps to the Temple*, and *The Delights of the Muses*. Another (third) edition, with additions, was published in Paris in 1652. This volume is ornamented with twelve vignette engravings, drawn by Crashaw himself. Recent editions of Crashaw are by W. D. Turnbull (1858) and by A. B. Grosart (1872, with supplement in 1888). Crashaw belongs to a group of religious poets among whom are George Herbert and Henry Vaughan. His fancies and conceits seem over-subtle and artificial, but there is in his work great copiousness and beauty of language.

CRAS'IS. See ORTHOGRAPHY, FIGURES OF.

CRAS'SUS. LUCIUS LICINIUS (B.C. 140-91). A Roman orator, who excelled all others of his time. He was as distinguished for his wit as for his rectitude in the capacity of proconsul. In B.C. 95 he was elected consul, along with Quintus Mucius Sævola (who had been his colleague in all his previous offices). During their consulship was enacted the *Lex Licinia Mucia de Ciribus Regundis*, banishing from Rome all freemen who had not the full rights of citizens. This embittered the feelings of foreigners toward Rome, and partly led to the Social War. As censor (B.C. 92) he closed all the schools of the rhetors—asserting that they had exercised a bad influ-

ence on the minds of young men. He died in consequence of the excitement attending a debate in the Senate.

CRASSUS, MARCUS LICINIUS (?—B.C. 53). A Roman triumvir. He was a zealous partisan of Sulla, and rendered him efficient service in the battle at the Colline Gate, B.C. 82, which sealed the fate of the Marians. As praetor he crushed the revolt of the gladiators under Spartacus in B.C. 71, and in the following year was made consul with Pompeius, a colleague whom he hated. On the other hand, Caesar valued the friendship of Crassus, the most wealthy of Roman citizens. During his consulate Crassus gave a feast to the people, which was spread on 10,000 tables, and distributed a provision of corn for three months. Plutarch estimates the wealth of Crassus at more than 7000 talents, and Pliny states that his lands were worth 8000 talents. In B.C. 60 Caesar, Pompeius, and Crassus entered into the first triumvirate. (See CESAR.) In B.C. 55, as consul with Pompeius, he obtained the Province of Syria, and professed to make preparations of war against the Parthians; but the acquisition of more wealth seems to have been his main object, and this he effected by plundering the towns and temples in Syria. At length, however, he undertook a campaign in B.C. 54, after which he returned to Syria. In the following year he set out again, but was misguided by a treacherous Arab, and utterly defeated at the river Bilechas by the Parthians. Crassus now retreated to the town of Carrhae, intending to pass into Armenia; but was beguiled into a conference with the Parthian general, Surenas, and was slain at the appointed place of meeting. His quaestor, Cassius, with 500 cavalry, escaped into Syria; but the remaining Romans were scattered and made prisoners, or put to death.

CRATÆGUS (Neo-Lat., from Gk. *κράταιγος*, *krataigos*, a kind of thorn). A genus of plants of the natural order Rosaceæ, very nearly allied to *Mespilus* (medlar) and *Pyrus* (pear, apple, etc.). The species are about seventy, natives of the temperate parts of the Northern Hemisphere, being well represented in North America, and in general have flowers in beautiful terminal corymbs. They are all large shrubs or small trees, more or less spiny, hence the name thorn has been very generally applied to them. The only native of Great Britain is the common hawthorn (q.v.) (*Cratægus oxyacantha*). Most of the species resemble it in habit, size, form of leaf, etc. A number of species are now frequent in plantations and shrubberies. Of these, perhaps the most common is the cockspur thorn (*Cratægus crus-galli*), a native of North America from Canada to South Carolina. Its leaves are not lobed; its fruit is rather larger than that of the hawthorn. The azarole (*Cratægus azarolus*), and the aronia, a native of the south of Europe and of the Levant, are occasionally cultivated for their fruit, which is about the size of the Siberian crab, and is used either for dessert or for pies. *Cratægus orientalis* and *Cratægus tanacetifolia* have also fruit of considerable size. The latter is much eaten in Armenia. *Cratægus Mexicana* has a large, but inedible, apple-like fruit. It is, however, very ornamental. After the cockspur thorn, the best-known of the American species are probably the scarlet thorn (*Cratægus coccinea*),

Washington thorn (*Cratægus cordata*), *Cratægus Douglasi*, and *Cratægus punctata*. The wood of most of the species much resembles that of the hawthorn. It is common to graft the rarer species on the hawthorn.

CRATCH CRADLE (from OF. *creche*, Ger. *Krippe*, crib), also called CAT'S CRADLE and SCRATCH CRADLE. A childish game, played by two persons holding an endless string symmetrically in the fingers of the two hands, and taking it off each other's hands, so as to form a new pattern at once.

CRATCH'IT, BOB. The father of Tiny Tim in Dickens's *Christmas Carol*—a good-hearted little man, the poorly paid clerk of the miserly Scrooge.

CRATCHIT, TIM. In Dickens's *Christmas Carol*, the crippled son of Bob Cratchit, known as 'Tiny Tim.'

CRATER (Lat., from Gk. *κρατήρ*, *kratēr*, mixing-bowl, from *κερᾶνναι*, *kerannnai*, to mix). The bowl-shaped or conical cavity through which materials are ejected during a volcanic eruption. At the bottom the crater communicates by a pipe or chimney with the heated interior of the earth. When of small size a volcano usually erupts through a single crater at the summit, but, as the mountain mass increases by accumulation of material, the lava may find lines of lesser resistance through fissures in the sides. In this way subsidiary craters are formed, one of which in the course of time may become the principal crater, or they all may be buried beneath the renewed outpourings of the primary crater. The Peak of Teneriffe has a number of minor funnels on its sides and summit. In volcanoes of an explosive type, the whole top of the mountain may be blown off during an eruption, forming an immense crater, within which subsequently new cones may arise in concentric arrangement. This structure, called 'cone-in-cone,' is shown by Vesuvius, whose active crater is partially encircled by a rampart (Monte Somma) many miles in diameter. Volcanello of the Lipari Islands has three craters on the summit. The craters of extinct or dormant volcanoes are sometimes filled with water, and thus are formed crater lakes. Many of the beautiful lakes of Italy and the well-known Crater Lake of Oregon originated in this way. See VOLCANO.

CRATER, THE. A novel by James Fenimore Cooper (1847), describing a Utopian settlement on the Pacific Coast.

CRATER LAKE. A lake in Klamath County, Ore., in the Cascade Mountains, lying at an altitude of over 6200 feet above the sea. It is of exceptional interest on account of its location in the crater of a partly destroyed volcano (Map: Oregon, C 7). It is about 20 miles in circumference and is completely surrounded by cliffs varying in height from 500 to 2000 feet. Judging from its existing state, the cone once must have extended upward a considerable distance above the present cliffs, the destruction of the upper portion being attributed to explosive activity.

CRATERUS (Lat., from Gk. *Κρατερὸς*, *Krateros*). One of the favorite generals of Alexander the Great. He commanded a division of the royal body-guard in the Asiatic campaigns, and was sent back to Macedonia as regent, by the

King, in B.C. 323. On the division of the empire after the death of Alexander, Craterus received, jointly with Antipater, the government of Macedonia, Greece, Illyria, and Epirus, Antipater taking command of the military forces and Craterus attending to civil affairs. He formed an alliance with Antigonus (q.v.) against Perdiccas and invaded Asia with an army, but was defeated and slain by Eumenes in Cappadocia (B.C. 321).

CRATES, *krátēs* (Lat., from Gk. *Κράτης*, *Kratēs*). An Athenian comic poet of the fifth century B.C. He began his career as an actor in Cratinus's plays, and won his first victory in B.C. 449. Aristotle says that he was the first to give up personal satire in comedy; he likewise made the innovation of introducing a drunken character on the stage. We have the titles of fifteen plays and scanty fragments. Consult Koek, *Comicorum Atticorum Fragmenta* (Leipzig, 1880).

CRATES. A cynic philosopher of Thebes, of the fourth century B.C. Scorning the large property which he inherited, he moved to Athens and became an eager disciple of Diogenes and one of the most eminent of the Cynics. He was an excellent orator and skillful poet. Interesting fragments of his poetry have been edited by Bergk, *Poetæ Lyrici Græci* (Leipzig, 1882). The thirty-six letters which bear his name are generally thought to be spurious. They are edited by Hercher, *Epistolographi Græci* (Paris, 1873). Consult, also, Zeller, *Philosophie der Griechen*, vol. i. (Tübingen, 1892).

CRATES. A Greek grammarian and Stoic of the second century B.C. He was the head of the Pergamene Library and the chief opponent of Aristarchus. He devoted himself to the interpretation of Greek authors, especially of Homer; he likewise defended the grammatical theory of anomaly in opposition to the Alexandrian doctrine of analogy. (See ANOMALISTS AND ANALOGISTS.) He assisted in enlarging and cataloguing the Pergamene Library; and his work on the Attic dialect was much employed by later grammarians. About 167 B.C. he was sent by King Attalus on an embassy to Rome, where he introduced the study of formal grammar. Consult: Wachsmuth, *De Cratete Mallota* (Leipzig, 1860); Susemihl, *Geschichte der griech. Litteratur in der Alexandriner Zeit*, vol. ii. (Leipzig, 1892).

CRATINUS (Lat., from Gk. *Κρατίνος*, *Kratinos*) (? c.421 B.C.). An Athenian comic poet. He was born in the latter part of the sixth century B.C., and was one of the seven poets of the Old Comedy named in the canon of the Alexandrians. He first presented a comedy in 453; in all he left twenty-one plays with which he had won nine victories. He is said to have been the first to give comedy a political turn, and by the introduction of a third actor to place it on a level with tragedy. A follower of Cimon and the Conservative Party, he sharply attacked Pericles in two plays; and in his *Ἀρχιλοχοί*, *Archilochoi*, he represented a contest of poets which may well have been Aristophanes's model in his *Frogs*. Aristophanes defeated Cratinus in 425 with his *Acharnians*, and in 424 with the *Knights*. In the parabasis of the latter play he refers to his elder rival as 'an ancient ruin,' whereupon Cratinus retorted in 423 with his

Wineflask, which won the first prize over Aristophanes's *Clouds*. The fragments of his work are collected by Kock, *Comicorum Atticorum Fragmenta*, vol. i. (Leipzig, 1880).

CRATIPPUS (Lat., from Gk. Κράτιππος, *Kratippos*). A Peripatetic philosopher. He was a native of Mitylene, and a contemporary of Cicero. He appears to have been held in the highest estimation by the great men of his age. Cicero calls him the prince of all the philosophers whom he had known. Cratippus accompanied Pompeius in the latter's flight after the defeat at Pharsalia, and conferred upon him the consolations of philosophy; and Brutus went to Athens, where Cratippus had lately settled, to listen to his lectures even while making preparations to meet Octavius and Antonius. Nothing that Cratippus wrote has survived.

CRAUK, krá'úk'. GUSTAVE ADOLPHE DÉSIÉ (1827—). A French sculptor, born in Valenciennes. He was a pupil of Pradier, and won the Prix de Rome in 1851. His works are to be found in many of the public buildings and churches of Paris, and in the museums of Versailles, Amiens, Grenoble, Lille, and Valenciennes. Among them are: "Victory Crowning the French Flag" (1864), a bronze group, his masterpiece; "Twilight" (1870); the monument to Admiral Coligny (1899); "Youth and Love" (in the Luxembourg); and the bronze statue of Dupuytren.

CRAVEN, ALFRED WINGATE (1810-79). An American civil engineer, born in Washington, D. C. He was appointed engineer commissioner to the Croton Water Board in New York City in 1849, and his connection with that board was notable for the number and value of the works which he projected and superintended. Among these were the Central Park Reservoir, completed in 1867; the reservoir at Boyd's Corners, and the survey of the Croton Valley. The establishment of the sewerage system of New York is largely due to his endeavors. He was the first president of the American Society of Civil Engineers.

CRAVEN, ELLIJAH RICHARDSON (1824—). An American clergyman, born in Washington, D. C. He was educated at the College of New Jersey and at Princeton Theological Seminary, and in 1865 he was appointed a director of Princeton. In 1878 he became chairman of the committee appointed to revise the Book of Discipline of the Presbyterian Church, and he was made Moderator of the General Assembly of that Church in 1885. Afterwards he served as president of the board of directors of the Newark German Theological Seminary, Bloomfield, N. J. For more than thirty years (1854-87) he was pastor of the Third Presbyterian Church in Newark, N. J. In 1887 he became secretary of the Presbyterian Board of Publication. He translated Lange's *Commentary on the Revelation*.

CRAVEN, ELIZABETH BERKELEY, Lady. See ANSPACH, MARGRAVINE OF.

CRAVEN, PAULINE DE LA FERRONAYS, Madame AUGUSTUS (1820-91). A French religious romancer, born in Paris. She is best known for her *Histoire d'une sœur* (1866), an idyllic picture of an aristocratic Roman Catholic French family and of the slow passing-away, through consumption, of a simple-minded, noble, and deeply religious woman. Madame Craven's father

was at one time French ambassador to Berlin. She traveled widely, and after marriage lived much in England, writing articles on English politics, and biographical sketches of *Sister Nathalie Narishkine* and of *Lady Georgiana Fullerton*, as well as *Reminiscences* of England and Italy. She died in Paris, April 1, 1891. Her novels have been as popular perhaps in English translations as in the original. The best are: *Anne Severin*; *The Enigma's Answer*; and *Fleurange*, in all of which she pleads persuasively the cause of Roman Catholicism, and seeks in emotional ecstasy the only life that seems to her worth the living. To some her books will seem morbid, to others strong, but her fervid spirit appeals to all.

CRAVEN, THOMAS (1808-87). An American naval officer, born in Washington, D. C. He entered the navy in 1822; took part in the capture of the pirate *Federal*, in the West Indies, in 1828; and commanded Captain Wilkes's flagship in the Antarctic exploring expedition in 1838. He was commissioned captain in 1861, commanded the Potomac flotilla, and in the same year took part in the capture of New Orleans and the operations on the Mississippi. In 1866 he was assigned to the command of the Mare Island Navy-yard and was raised to the rank of rear-admiral.

CRAVEN, TUNIS AUGUSTUS MACDONOUGH (1813-64). An American naval officer, brother of Thomas Craven (q.v.). He was born in Portsmouth, N. H.; entered the navy in 1829; took part in the conquest of California, and in 1857 made a survey of the Isthmus of Darien for a prospective ship-canal. He saved the fort at Key West for the United States Government at the beginning of the Civil War, and was promoted to the rank of commander. While chasing the Confederate ram *Tennessee*, in the battle of Mobile Bay, his vessel, the monitor *Tecumseh*, struck a torpedo, and sank with himself and nearly every one on board.

CRAWFISH, or **CRAYFISH** (OF. *crevice*, *crevisse*, Fr. *écrevisse*, from OHG. *ehrebiz*, Ger. *Krebs*, crawfish). A fresh-water or terrestrial crustacean (*Istacus fluvialilis*) nearly allied to the lobster, from which, however, it differs in having the middle plate of the tail-fin transversely divided by a suture. It inhabits the rivers and streams of many parts of Europe, making burrows in clayey banks, and coming forth at night in search of food, which consists chiefly of mollusks, small fishes, larvæ of aquatic insects, and animal substances of almost any kind. It is esteemed for the table, and is readily attracted by a bait of decaying flesh or animal garbage inclosed in a net or in a bundle of twigs, by which many crawfish may be captured at a time. The use of the name has been extended until it is now applied to any of the fresh-water species of the family Astacidae. In the United States it is universally applied to any one of several species of *Cambarus*, which agree very closely in structure and habits with the common crawfish of Europe. They are six inches or so in length and of a greenish-brown color. They frequently do much damage to dikes and levees by opening water passages, as told in *Proc. Assoc. Econom. Entomologists* for 1895 (U. S. Dept. Agric., 1896). For general facts, consult Huxley, *The Crayfish: An Introduction to*

Zoölogy (London, 1887); "Revision of the *Astacidae*," *Memoirs Museum Comparative Zoölogy*, vol. x., No. 4 (Cambridge, Mass., 1885).

CRAWFORD, FRANCIS MARION (1854—). An American novelist, chiefly resident in Europe. He was born at Bagni di Lucca, Italy, a son of the sculptor Thomas Crawford. Of cosmopolitan education in America, England, and Germany, his first literary venture was as editor of the *Allahabad Indian Herald* (1879-80). His voluminous fiction was begun by *Mr. Isaacs*, a story of modern India (1882). The more significant of its frequent successors are *Dr. Claudius* (1883), *A Roman Singer* (1884), *Zoroaster* (1885), *A Tale of a Lonely Parish* (1886), *Saracinesca* (1887), *Paul Patoff* (1887), *Greifenstein* (1889), *Sant' Ilario* (1889), *A Cigarette Maker's Romance* (1890), *The Witch of Prague* (1891), *Don Orsino* (1892), *Pietro Ghisleri* (1893), *The Ralstons* (1894), *Casa Braccio* (1895), *Corleone* (1897), *Via Crucis* (1899), and *In the Palace of the King* (1900). Historical and descriptive are *Constantinople*, a book of travels, *Ave Roma Immortalis* (1898), and *Rulers of the South* (1900). In 1893 he published a slight brochure, entitled *The Novel: What It Is*. The *Saracinesca* series, the scenes of which are laid in modern Rome, is generally regarded as his most important performance; his strictly American fiction is less popular. Few recent novelists have held their readers more steadily than Mr. Crawford, in spite of the great number of his books.

CRAWFORD, GEORGE WASHINGTON (1798-1872). An American lawyer and statesman. He was born in Georgia, graduated at Princeton in 1820, and in 1822 was admitted to the bar. From 1827 to 1831, he was State Attorney-General, and from 1837 to 1842, with the exception of one year, was a member of the State Legislature. In 1846 he was in Congress, in 1843 and 1845 was elected Governor of Georgia, and from 1849 to 1850 was Secretary of War in President Taylor's Cabinet.

CRAWFORD, ISABELLA VALANCY (1851-87). A Canadian poet. She was born in Dublin, Ireland, went to Ontario as a child, and lived at Peterboro and Toronto. She wrote verse showing marked originality and intense lyrical power, comprised mostly in *Old Spookses' Pass*, *Malcolm's Katie*, and *Other Poems* (1884).

CRAWFORD, LORD. The captain of the Scottish archers, the body-guard of Louis XI., in Scott's *Quentin Durward*.

CRAWFORD, NATHANIEL MACON (1811-71). An American educator, born in Georgia. He graduated at the University of Georgia in 1829, taught mathematics, and became a Baptist minister. In 1846 he was appointed professor of theology in Mercer University, becoming president of this institution in 1856. He accepted the presidency of Georgetown College, in Kentucky, in 1865, and remained in this position almost to the time of his death. He published *Christian Paradoxes*.

CRAWFORD, THOMAS (1814-57). An American sculptor, born in New York, March 22, 1814. He was a contemporary of Hiram Powers, and, like him, passed much of his time in Rome, where his studio was the resort of travelers and lovers of art. He studied in Rome under Thorwaldsen. His life was comparatively short, but

he has left many interesting examples of his work. Munich was especially appreciative of his art, and celebrated the casting of two of his large statues by impromptu festivals. His monument to Washington, cast in bronze in Munich, was after his death completed by Randolph Rogers. He died in London, October 16, 1857. Among his principal works are the "Statue of Beethoven," placed in the Boston Music Hall, and "The Indian," to be seen in the New York Historical Society. His "Orpheus," "Adam and Eve After the Expulsion," and a bust of Josiah Quincy, are in the Boston Athenæum. The figure of "Liberty," on the Capitol in Washington, is his, and he designed the pediment and bronze doors of this building. Among his smaller works are "Flora," "Mercury and Psyche," "Daughters of Herodias," and "Aurora." Crawford executed many bas-reliefs, and eighty-seven of his plaster casts were presented by his wife to the Commissioners of Central Park, who arranged them in a building for public exhibition.

CRAWFORD, WILLIAM (1732-82). An American soldier, born in Berkeley County, Va. He was for a time assistant surveyor to George Washington, and he served as ensign of Virginia Rifles in the French and Indian War. He accompanied Braddock's luckless expedition against Fort Duquesne in 1755, and in 1776 was appointed lieutenant-colonel of the Fifth Virginia Regiment. In 1781 he resigned from the army with the rank of colonel. At the request of Washington, and of General Irvine, he assumed command in 1782 of an expedition against the Delaware and Wyandot Indians near the Sandusky River, who had long devastated the frontier. On June 4, on the plains northeast of the present site of Sandusky, he encountered a combined force of about three hundred Indians and British soldiers from Detroit. His troops having been discouraged by the accession of reinforcements to the enemy, he ordered a retreat which soon became a confused flight. He was himself separated from the main body, captured by a band of Delawares, and burned at the stake amid fearful torture. Notwithstanding his wholly creditable Revolutionary record, his leadership on this occasion appears scarcely to have been efficient. Consult: Butterfield, *Expedition Against Sandusky* (Cincinnati, 1873); Roosevelt, *The Winning of the West*, vol. ii. (New York, 1896); and Hill, "Crawford's Campaign," in *Magazine of Western History* (Chicago, 1885).

CRAWFORD, WILLIAM HARRIS (1772-1834). An American politician. He was born in Amherst, Va., February 24, 1772, but removed with his parents to South Carolina in 1779, and to Georgia in 1783, where, in 1798, he was admitted to the bar. In 1802 he was chosen a member of the State Senate, and in 1807 was chosen to fill a vacancy in the United States Senate. During the canvass he fought two duels, in the first of which he killed a man, while in the second he was himself wounded. He was elected to the Senate in 1811, and in 1812 was chosen president pro tempore of that body. He at first opposed, but finally supported, the war with England. In 1813 he was appointed Minister to France, where he became a general favorite, and in particular was an intimate friend of Lafayette. In 1815 he was made Secretary of War, and the next year Secretary of the Treasury, an office which he retained until

1825. Crawford had been a candidate for the Presidential nomination in 1816, and now thought himself entitled to succeed Monroe as President, and was regularly nominated by the Congressional caucus which was then controlled by him; but the caucus system was then temporarily superseded (see CAUCUS), and there were four other candidates against him—Calhoun, John Quincy Adams, Jackson, and Clay. Calhoun was pacified with the Vice-Presidency, to which he was chosen by 182 out of 260 votes. There was no choice for President, the vote being: Jackson, 99; Adams, 84; Crawford, 41; Clay, 37. About the time of the election Crawford was stricken with paralysis, from which he never wholly recovered. His condition rendered it impossible to consider him a candidate when the election came to be decided in the House of Representatives, although, even in such a condition, he received four of the twenty-four votes. From this time Crawford was out of the political field. He served as judge of the northern circuit of Georgia from 1827 until his death, which occurred September 15, 1834.

CRAWFORD, WILLIAM HENRY (1855—). An American educator, born at Wilton Centre, Ill. He graduated at the Northwestern University and the Garrett Biblical Institute, and became a minister in the Methodist Episcopal Church. He was appointed professor of historical theology in the Gammon Theological Seminary, Atlanta, Ga., in 1889, and in 1893 became president of Allegheny College (Meadvile, Pa.).

CRAWFORD AND BALCARRES, ALEXANDER WILLIAM CRAWFORD LINDSAY, Earl of (1812-80). An English author. After graduating at Cambridge, he traveled extensively in Egypt and Asia Minor. He took a considerable interest in astronomical investigations, and the expedition to the island of Mauritius in 1874, to observe the transit of Venus, was organized by him. For some inexplicable reason, his body was stolen shortly after its burial at Dunecht, and was not discovered until about fourteen months later in the woods near by. Among his principal publications may be mentioned: *Letters on Egypt, Edom, and the Holy Land* (1838); *Sketches of the History of Christian Art* (2d ed., 1885); *Argo, or the Conquest of the Golden Fleece*, an epic in ten books (1876).

CRAWFORD NOTCH. A defile in the White Mountains, New Hampshire, at an elevation of 1915 feet, between Mount Webster and Mount Willey, each about 4000 feet high. The Saco River, entering through a narrow passage, traverses the Notch, which is remarkable for its impressive rock scenery.

CRAWFORDSVILLE. A city and the county-seat of Montgomery County, Ind., 40 miles northwest of Indianapolis; on the Terre Haute and Indianapolis, the Cleveland, Cincinnati, Chicago and St. Louis, and other railroads (Map: Indiana, C 2). It is the seat of Wabash College, established in 1832, and contains a fine county court-house. The city has manufactures of lumber, wagons, spokes and hubs, flour, foundry products, barbed wire, etc. Settled in 1822, Crawfordsville was incorporated in 1865, and is governed under a charter of that date, which provides for a mayor, elected every four years, and a city council. Population, in 1890, 6089; in 1900, 6649.

CRAWFURD, JOHN (1783-1868). A Scottish Orientalist, born in the island of Islay, Hebrides. He went as a physician to India, and served for five years in the army of the Northwest Provinces. Transferred to Penang, Malay Peninsula, he acquired a knowledge of the Malay language, which proved valuable on the occasion of Lord Minto's conquest of Java (1811). From 1811 to 1817 he held various posts in Java, from 1823 to 1826 administered the government of Singapore, and subsequently was sent on a difficult diplomatic mission to the Court of Ava. He published, in addition to an account of this mission (1829), a valuable *Grammar and Dictionary of the Malay Language* (1852), and a *Descriptive Dictionary of the Indian Islands and Adjacent Countries* (1856).

CRAWL-A-BOTTOM. A local name in the Mississippi Valley for two small fishes: (1) The largest of the darters (*Hudropterus nigrofasciatus*). See DARTER. (2) The hog-sucker or stone-roller (q.v.).

CRAW'LEY. The family name of several characters in Thackeray's *Vanity Fair*.

(1) **SIR PITT CRAWLEY**, the elder, of Queens Crawley, a rich, close-fisted old country squire, who proposed to Becky Sharp, but, as she was already married, contented himself with an intrigue with his butler's daughter, Miss Horrocks. (2) **SIR PITT**, the younger, his son; a cold-hearted prig, immersed in Parliamentary blue books. (3) **COLONEL RAWDON**, brother of Sir Pitt (the younger), and husband of Becky Sharp. He was a gambler and a roué, but his belief in his wife to the moment when her guilt seemed undeniable, and his love for his boy, cover the multitude of his sins. (4) **REVEREND BUTE**, brother of old Sir Pitt. A country clergyman of the old, port-drinking, hard-riding school, whose wife wrote his sermons for him. (5) **MISS CRAWLEY**, sister of Sir Pitt and Mr. Bute, for whose £70,000 all the family scheme.

CRAW'SHAW, WILLIAM HENRY (1861—). An American educator and author, born at Newburgh, N. Y. He graduated in 1887 at Colgate University and in the same year was appointed professor of English literature at that university, of whose faculty he became dean in 1897. He has published an edition of Dryden's *Palamon and Arcite* (Boston, 1898); and two excellently suggestive little works in criticism: *The Interpretation of Literature* (1896), and *Literary Interpretation of Life* (1900).

CRAYER, kri'ēr, Fr. pron. krā'ya', GASPARD (1584-1669). A Flemish historical and portrait painter, born in Antwerp. He lived for many years in Brussels, and in 1664 went to Ghent, for the churches of which he painted more than twenty altar-pieces. His works are to be found throughout Flanders and Brabant. Their main characteristics are vigor and boldness of design, and care and truthfulness in execution. Among the most important of them are: "Glorification of Saint Catharine" (in Saint Michael's, Ghent); "The Miraculous Draught of Fishes," "Adoration of the Shepherds" (Brussels Museum); "Decapitation of Saint John the Baptist" (Ghent Cathedral); "Judgment of Solomon," and "Martyrdom of Saint Blasius" (1668), his last work, both in the Ghent Museum. He was a contemporary of Rubens, and an admirable portrait painter in his own style, which differs

materially from that of the great colorists, partaking rather of the drier manner of the German School.

CRAYON (Fr. *crayon*, from *craie*, chalk, from Lat. *creta*, chalk). A term usually applied to pencils made of charcoal, pipe-clay, or chalk, colored with various pigments and used for drawing on paper, wood, or other materials. Blackboard crayons are made largely of chalk, while black crayons are composed of pipe-clay and lampblack. Those used for drawing on lithographic limestone are commonly made of a mixture of wax, lampblack, soap, and resin. *Pastel* is a mixture of chalk and coloring materials, worked into a paste with gum water. The vegetable colors used are turmeric, litmus, saffron, and sap-green, but should in every case be free from acid, as the latter reacts on the chalk. *Vienna white*, used by artists, is simply purified chalk. *Red chalk* is made from an ochery clay, that is, one containing much iron oxide. *Briançon chalk* and *French chalk* are popular names for soapstone, which is very different from chalk in its composition, being a silicate of magnesia. See CHALK; PENCILS.

CRAYON, GEOFFREY. The *nom-de-plume* adopted by Washington Irving, in *The Sketch-Book*, etc.

CRAZY CASTLE, THE. The nickname of Skelton Castle, the house of John Hall Stevenson, a kinsman of Sterne and the Eugenius of *Tristram Shandy*. He wrote a series of broad stories, called *Crazy Tales*, whence the name given to his house. For further information, consult Bagehot, *Literary Studies*, ii. (London, 1879).

CREAKLE, krē'k'l, Mr. The bullying master of Salem House, in Dickens's *David Copperfield*, the school to which David was sent.

CREAM (OF. *creme*, Fr. *crème*, from Lat. *cremor*, thick juice). The thick, light yellow substance, rich in fat, which rises to the surface of milk on standing. The methods of creaming milks, by setting and by the separator, are described under BUTTER-MAKING. The composition of cream is influenced by the method and condition of creaming, and varies within wide limits. Cream contains the same constituents as milk, but in very different proportions. The fat may vary from 10 to 70 per cent.; good cream for butter-making, or for household use, contains from 18 to 25 per cent. of fat, and very rich cream from 35 to 40 per cent. The richness of cream raised by the separator can be regulated at will. Cream is sometimes thickened artificially by adding gelatin, isinglass, etc. Cream which has been pasteurized, or heated to prevent souring, loses some of its thickness or viscosity, and the addition of sucrate of lime has been proposed to make it whip better. The famous clotted or 'clouted' cream of Devonshire, England, is prepared by heating milk which has stood for twenty-four hours in a shallow pan over a slow charcoal fire for a half to three-quarters of an hour, without boiling, allowing it to stand for twenty-four hours, and then skimming off the cream, which is sprinkled with sugar.

CREAMERY. A factory where butter is made from milk or cream, furnished by the farmers of the neighborhood. It is an American institution, and originated in New York about 1864, being suggested by the success of the cheese-factory (q.v.), which had been in operation for

several years. Within the past fifteen or twenty years the growth of the creamery system has been very rapid, and creameries are now thickly distributed over the principal dairy regions. They differ in their form of organization, and also in the method of operation. Coöperative factories are owned by the farmers ('patrons'), who supply the milk, and who choose from their own number a managing committee, or board. The cost of running the factory, and the proceeds of sales, are divided pro rata according to the milk, cream, or butter-fat contributed. This is the oldest and in many respects the most desirable form of organization. In the joint-stock and proprietary creameries the milk or cream is bought of the farmers under a contract, or the factory may make butter and dispose of it for its patrons, for a fixed charge per pound. The milk may be delivered at the creamery, where the cream is separated by power, the farmers receiving the skim milk for feeding; or the cream may be raised or separated by the farmers themselves and sent to the factory every two or three days. The latter are called 'gathered-cream creameries.' The cream-gathering plan originated in Wisconsin, and was the basis upon which creameries were established in New England, where it continues popular. The cream is raised by gravity usually, in deep cans, and is paid for by the 'space.' This measure has been shown to be an unreliable one, as the value of a space of cream for butter-making varies widely; and payment on the basis of the fat furnished, as determined by test, is beginning to be adopted.

Where the whole milk is furnished to the creamery, it is delivered daily, which involves a great deal of labor in hauling. In almost all cases the hauling devolves upon the milk-producer; often the farmers' living near together coöperate in this, or contract with some person who makes a business of doing the hauling. The milk was formerly paid for by the pound, this being a convenient means of measurement; but the injustice of this to the producers of rich milk, and the introduction of the Babcock milk test, have led to payment on the basis of the butter-fat. The milk of each patron is weighed as it is received and a sample taken for testing; usually the samples for a week or so are combined into a composite, to reduce the labor of testing. From the amount of milk delivered, and the fat content, the amount of butter-fat furnished by each patron is calculated at the end of the month. In most of the leading creamery districts the separator factory is now the favorite system. In many places these creameries have located 'skimming stations' at points convenient for the patrons, where the milk is run through the separator, and the cream then taken to the creamery. This reduces the labor of hauling to a minimum. The system of making butter at creameries is, in many respects, a vast improvement over the ordinary farm dairy practice. The use of machinery reduces the cost of butter-making, and the milk and cream are handled by experienced butter-makers according to the most approved methods. The result is a uniform product, equal to the best of the single dairies, and a great improvement over the average, which sells for a high price. Furthermore, there is less loss of fat in making than at farm dairies, and hence a larger quantity of butter is produced from the same cows. The labor and expense of making

and marketing the butter are removed from the farms and households. Creameries have been of great advantage to the farmers where they are located, and the payment for milk on its fat content has stimulated the farmers to keep better and more profitable cows. Some of the more modern creameries have a very large capacity. The Franklin County Creamery, at Saint Albans, Vt., was formerly the largest in the country, having a capacity of five or six tons of butter a day. There are now a considerable number equally as large, and several much larger, running up to fifteen tons of butter a day in some cases. A large creamery in Nebraska has over 100 skimming stations connected with it. In the Elgin district in Illinois creameries using 10,000 pounds of milk a day are quite common. See BUTTER-MAKING.

CREAM-NUT. See BRAZIL-NUT.

CREAM OF TAR/TAR (OF. *tartre*, from ML. *tartarum*. MGk. *τάρταρον*, *tartaron*, tartar, probably from Lat. *Tartarus*, Gk. *Τάρταρος*, *Tartaros*; hardly a corruption of Ar. *durd*, dregs, from *darida*, to lose the teeth). A potassium bitartrate that is contained in argol (q.v.), and is prepared by dissolving the argol in hot water and removing any coloring matter by means of clay or egg-albumen; the cream of tartar is then separated from the filtered solution by crystallization, and may be purified by recrystallization. Cream of tartar is a white crystalline compound that is soluble in water, and is used in medicine as a refrigerant and purgative. With sodium bicarbonate it is used as a substitute for yeast in raising bread. It is also the source of tartaric acid and of tartrates.

CREASY, krè'sī, Sir EDWARD SHEPHERD (1812-78). An English historian, born at Bexley, Kent. He became fellow of King's College, Cambridge, in 1834, and in 1837 was called to the bar. In 1840 he was appointed professor of modern and ancient history in the University of London, and in 1860 Chief Justice of Ceylon. He is most widely known for his *Fifteen Decisive Battles of the World* (1852), a work which has been very favorably received alike by the critic and the general reader. His other works, less known, but in many cases of almost equal merit, include an *Historical and Critical Account of the Several Invasions of England* (1852); *History of the Ottoman Turks* (1854-56); and *Imperial and Colonial Constitutions of the British Empire* (1872).

CRE'ATIN. See KREATIN.

CREATININ, krè-ät'i-nin. See KREATININ.

CREATION (Lat. *creatio*, from *creare*, to create; connected with *crecere*, to grow, Gk. *κρῶρος*, *koros*, youth, Goth. *hairda*, Ger. *Herde*, Eng. *herd*, OIr. *carn*, heap, Arn. *ser*, species, Skt. *śardha*, Ar. *sarīda*, species). THE. The act of the Supreme Being in bringing the universe into existence, and specifically the account of the divine activity contained in the Book of Genesis. According to this account God created the 'heavens and the earth' by successive acts throughout a period of six days. On the first day light was produced and day and night divided; on the second day the firmament (q.v.) was created and the waters separated; on the third day the dry land appeared and plant life began; on the fourth day the heavenly luminaries were made; on the fifth

day aquatic life and birds appeared; on the sixth day land animals and man were created; and on the seventh day God rested from His work and instituted the Sabbath. This narrative has been regarded as veritable history, as a primitive and crude attempt to construct a scientific theory, as poetry, and as pure myth. It is significant that at the present time attempts to harmonize the narrative with the teachings of science are not in favor even with the more conservative, while the most radical critics recognize its value as a medium for teaching moral and religious truth. According to the compilatory hypothesis of the origin of the Hexateuch, Genesis contains two creation narratives. The first, beginning with chap. i. and extending through the first clause of chap. ii. 4, belongs to the Priestly Writer and was written by him to emphasize the importance of the Sabbath. The other, chap. ii. 4b-7, is from JE (see ELOHIST AND YAHWIST), is given only partially, and is not in all its details consistent with the account of the Priestly Writer. Nevertheless, the narratives may have a common source, and the discrepancies be due to different workings-over which they have undergone before reaching their present form. In 1875 portions of a Babylonian creation myth, previously known only in fragmentary quotations from Berosus (q.v.), were found in cuneiform character among the material brought from the palace of Assurbanipal, and were deciphered by George Smith. Since that time other fragments have been discovered and the myth is now quite well known. It has striking points of resemblance with the narrative of Genesis, which have been explained by two hypotheses: (1) that both accounts are independent developments of an original Semitic myth; and (2) that the Hebrew account is borrowed from the Babylonian. If the latter hypothesis is correct, the borrowing may have taken place at any one of several periods when relations between the Babylonians and Israel were specially close. It may be that the Hebrews first learned the story on their entrance into Palestine, since the Tell-el-Amarna tablets have proven that Babylonian influence prevailed there as early as B.C. 1500. Traces of Phœnician, Egyptian, and Persian influence have also been found by some scholars, and there are undeniable resemblances to cosmogonies of other peoples, even the more primitive, for it should be noted that the differences are marked, even where comparison is made with the Babylonian account. Consult the commentaries on Genesis (see GENESIS, BOOK OF); Jensen, *Die Kosmologie der Babylonier* (Strassburg, 1890); Gunkel, *Schöpfung und Chaos in Urzeit und Endzeit* (Göttingen, 1895); Smith, *The Chaldean Account of Genesis* (New York, 1876).

CREATION, THE. (1) A philosophical poem by Sir Richard Blackmore (1712), which was highly commended by Addison and Johnson. (2) A celebrated oratorio by Haydn, first produced in Vienna in 1798.

CREATIONISM. A term recently applied to the theory of the origin of man which is opposed to evolutionism. (See ANTHROPOLOGY; EVOLUTION.) As a theological term, it has long been in use to designate the theory of the origin of man's soul by the special creative act of God in the case of each individual. It is opposed to 'traducianism,' which is the theory that the soul

of the individual is derived by generation from the souls of his parents as truly as is his body. It is to be distinctly affirmed that the Scriptures give no decision upon this question. Creationists have sometimes quoted the account of the creation in Genesis ii. as favoring their view. But at most that would declare the mode of the original creation of the soul, not the method of its subsequent individual appearance in the world. The body, which is derived from that of the parents, is no less a creature of God than the soul, though this originates by special creation. Again, creationism is sometimes said to be alone consistent with the immateriality of the soul, since this does not admit of its composition or its division into parts and consequently of its derivation from other souls, which must be by the division of these souls. But it is now known that bodies, even, are not derived from those of their parents in such a way as to give much point to this argument. The developing body builds itself in accordance with the law of heredity. It is indisputable that mental traits are inherited, so that, as a matter of fact, the souls of children are built upon the pattern of their parents. If this is traducianism for the body, it is the same for the soul. Theories of original sin have also been brought to bear upon this subject, and it has been said that if Christ derived His soul by translation from Mary, then He acquired also the taint of original sin, and so could not be sinless. Hence His soul must have been a new creation. But this argument presupposes for ordinary men a derivation of original sin, and so a traducian origin. The drift of modern thinking is in favor of traducianism, because it emphasizes as never before the law of heredity. With the body is inseparably associated life, and with life the soul, since all living forms manifest some of the qualities of the soul. In respect to both body and soul there are laws of inheritance, which are none the less real because they are very intricate and obscure. Although the soul is immaterial and hence indivisible, it has a structure, a plan, an organization. It is this that is repeated in following generations. There is, of course, no division of the soul that some particles of it may make the soul of the child, or contribute to this. Modern traducianism is therefore simply this, that the soul as well as the body of a human individual is formed by the indivisible working of its own immanent powers under the law of heredity upon the pattern of its race, specially embodied in its own parents. Many theologians, however, perhaps with the highest wisdom, still refrain from adopting either theory, but emphasize the mystery enveloping the whole subject of life, and say with Augustine, "When I wrote my former book I did not know how the soul derives its being, and I do not know now." See **TRADUCIANISM**; **ORIGINAL SIN**.

CRÉBILLON, krá'bé'yón'. CLAUDE PROSPER JOLYOT DE (1707-77). A noted French story-teller and wit. He was born in Paris, February 14, 1707, the son of the dramatist Prosper Jolyot Crébillon. Except for a five years' exile for political and theological allusions in his novels, especially concerning the Papal bull *Unigenitus*, which led also to a brief imprisonment in the Bastille, he passed his life in Paris. Though he occupied at one time the office of literary censor, his fiction is a byword for its licentious suggestive-

ness. It shows a graceful talent, however. His best known tales are *L'écumeiro ou Tanzi et Nécularné* (1734), followed in 1736 by the notorious *Les égarements du cœur et de l'esprit*, and in 1745 by *Le sophia*, than which it has not been possible to descend further in the refinements of immorality; not a gross word and not a decent thought. The conversation is witty, the manners refined after their kind. This smirking voluptuousness is only the completest literary expression of the spirit of the time, that was sapping the foundation of national strength and character and preparing the way for the Revolution. He died in Paris, April 12, 1777.

CRÉBILLON, PROSPER JOLYOT DE (1674-1762). A noted French tragic poet, born in Dijon, January 13, 1674. He abandoned the law for the stage on the success of *Idoménée* (1705), and with *Atrée et Thyeste* (1707) took first rank among the tragic poets of his time. Among the more noteworthy of his subsequent tragedies are *Electre* (1708); *Rhadamiste et Zénobie* (1711), his best work; *Pyrrhus* (1726); and *Catiline* (1748). Crébillon became an Academician in 1731 and held several minor public offices, among them that of stage censor. Later he became indigent, but died in comfort through the profits of an edition of his *Works* (1750), made at the royal order and charge. He died in Paris, June 17, 1762. Crébillon suffered, as did his fame, from the envy and enmity of Voltaire, himself a tragic poet of greater polish, though less rugged power. He is apt to mistake the horrible for the grandiose, and inflation for energy in diction, as did Corneille, whom among French dramatists he most resembles both in his qualities and his defects. Crébillon's *Works* have been often edited, best perhaps by Didot (1812). There is a *Life* by the Abbé de la Porte, and a discriminating critical essay on Crébillon's place in the development of French drama in Brunetière's *Epoques du théâtre français*. See also Dutrait, *Etude sur Crébillon* (1895).

CRÈCHE, krâsh (Fr., manger, crib.) A public nursery where children can be left by their mothers and cared for while the mothers are at work. The children are fed, provided for, and instructed according to their capacity, for a merely nominal fee. Day nurseries in American cities perform similar services, usually free of charge.

CRÉCY, krá'sé'. A small town of France, in the Department of Somme, on the Maye, about 12 miles north of Abbeville (Map: France, II 1). It is celebrated as the scene of a brilliant victory gained August 26, 1346, by Edward III, with 35,000 English soldiers, over a French army amounting to about 75,000 men under the command of Philip VI. In this great battle vast numbers of the French nobility perished as well as King John of Bohemia and eleven other princes, who were fighting on the side of France. Altogether about 30,000 of the French army fell. At Crécy the Black Prince greatly distinguished himself and gained his spurs; and the crest of the slain Bohemian King, consisting of three ostrich-feathers, with the motto *Ich dien* ('I serve'), was adopted by him in memory of the victory, and still continues to be borne by the Prince of Wales.

CREDE, krâ-dâ'. KARL SIGISMUND FRANZ (1819-92). A German gynecologist, born in

Berlin. He studied medicine in Berlin and in Heidelberg, and in 1852 was made director of the School of Midwifery and of the obstetric department of the Charité in Berlin. Four years later he was made professor of obstetrics and director of the lying-in hospital in Leipzig. His published works include the following: *Klinische Vorträge über Geburtshilfe* (1853-54); *Die Verhütung der Augeneutzündung der Neugeborenen* (1884); *Gesunde und kranke Wöchnerinnen* (1886); *Lehrbuch der Hebammen* (6th ed., revised by Leopold and Zweifel, Leipzig, 1897). From 1853 to 1869 he was co-editor of the *Monatsschrift für Geburtskunde*, and, for many years, of the *Archiv für Gynäkologie*.

CRE'DENCE (It. *credenza*, belief, cupboard, ML. *credentia*, from Lat. *credere*, to believe). A side-table, buffet, or sideboard, on which dishes were placed or kept before meals; a cupboard in which stores or household gear were kept. Also, in the ecclesiastical terminology of the Roman Catholic and Episcopalian churches, a small table or shelf near the altar or communion table on which the bread and wine are laid before being consecrated; in the Greek Church it is called the *trapeza prothesis*. The Oxford movement was largely responsible for its re-establishment in the Episcopal churches of Great Britain and America.

CREDI, krà'dè, LORENZO DI (1459-1537). An Italian painter, born in Florence. He was a pupil of Andrea Verocchio, the master of Da Vinci and Perugino. His style was at first severe, like that of Verocchio, but in later life his manner became softer. He executed his work with great care—in fact, he paid almost too much attention to detail. Throughout his life he was influenced by the quality of Da Vinci's art. Their pictures have been mistaken for each other, and the charm of Lorenzo is of the subtle, intangible kind that made Da Vinci the master that he was. His favorite subject was the Madonna and Child, surrounded by angels, shepherds, or the worshiping kings. A beautiful example, the "Adoration of the Shepherds," is in the Accademia delle Belle Arti in Florence. Another equally fine is in the Louvre, and still another in the National Gallery, in London. In the Uffizi Gallery, Florence, there are some fine portraits by him.

CREDIT (Fr. *crédit*, from Lat. *credidum*, a loan, neut. p. p. of *credere*, to trust). In political economy this term indicates broadly the confidence which is reposed in the ability and purpose of men to meet future obligations. It is defined by J. S. Mill as permission to use another's capital, and by H. D. MacLeod as 'a right of action.' While it rests etymologically upon trust in human nature, the term embraces many operations in which this plays a small part, in which by the establishment of claims to portions of the debtor's estate the creditor assures himself of the repayment. A familiar illustration of such transactions are the loans of bankers upon collateral security.

From an objective point of view, the essence of a credit transaction is that on one side the transfer of goods or money is immediate, on the other that the return is deferred. Personal credit resting solely upon the good faith of the debtor is the earliest form in which credit appears, and is still widely prevalent, as in the

book accounts of retail merchants. But in the larger transactions of commerce credit could not have gained its prominent place without the intervention of instruments of credit. These assume various forms, notes, drafts, mortgages, bonds, etc.; but all have a common purpose—to insure the transferability of the claim against the debtor. Without them the lender—for whatever form the credit may assume it is always in the nature of a loan—must await the pleasure of the debtor or the termination of the contract before he can enter into possession of his own. With these instruments of credit he practically has control of his capital whenever he desires to use it. By transferring his claim to others he can secure his capital at any time.

Credit rests ultimately upon the fact that many persons possess wealth who have no present use for it and are willing that it should be employed by others. If circumstances arise, as in times of panic, when each seeks to secure for himself the actual possession of his wealth, then credit cannot be obtained, and those whose transactions require it must either pay exorbitant prices for it or be crushed out. This explanation of credit will serve to indicate the important function which banks play in the world of business. They are reservoirs of credit. In them are gathered claims upon the unemployed wealth of the community, and through them this wealth is directed by loans into channels of usefulness. It is brought together in small and large quantities from all classes of persons who do not immediately need it, and who are unable or unwilling to loan it directly. From the point of view of individuals credit is frequently spoken of as capital, because, like capital, it increases their productive power. But credit from a national point of view is only to be regarded as capital in so far as it diminishes the amount of wealth which would otherwise lie idle, and increases that which is devoted to productive purposes. An effective organization of credit does not produce wealth, but draws out wealth, and enhances its usefulness. Hence a nation in which credit, as in Anglo-Saxon communities, is highly organized, will have a higher productive capacity than one in which a primitive organization prevails. Credit is not without its dangers, and when the credit organization is out of joint the results are disastrous. This is the price of progress. As the disasters to a railroad express train are more severe than those which overtake the lumbering wagons which preceded it, so the commercial disasters of a highly organized nation with a broad development of credit are more serious than those of less advanced peoples. The remedy is not to go back to the wagons, but to apply every device to insure the safety of the modern vehicle. For a clear analysis of credit, consult: MacLeod, *Theory of Credit* (London, 1889-91); Dunbar, *Chapters in the History and Theory of Banking* (New York, 1892); *Report of Comptroller of the Currency, 1896*. See BANKS; CRISIS, ECONOMIC.

CREDIT, LETTER OF. This term is applied in general to commercial instruments, usually in the form of a letter in which one party addresses a second, requesting him to pay certain sums of money to a third. It is in effect a draft, except that the amount to be paid is stated, not absolutely, but as a maximum not to be exceeded. It presupposes that arrangements exist by which

the party who sends the letter shall reimburse him who makes the payment. Such letters of credit may be drawn on one or on several parties, being in the latter case sometimes called 'circular letters of credit.' They are much used by travelers, and the leading houses issuing them have correspondents in all parts of the world. Those who issue them are generally so well known to the banking fraternity that any banker, whether a correspondent or not, will, upon proper identification, make payment on the letter. When the letter is issued, the person to whom it is given either pays outright the amount named in the letter, or furnishes acceptable security that the maker shall be reimbursed for the drafts upon him.

The alternative for the letter of credit is the travelers' note. This differs from the letter in being issued in coupons, sometimes expressed on the face of the coupons for the currencies of other countries. Such travelers' notes were formerly issued extensively by the Cheque Bank of London, but the business in the United States has recently passed largely into the hands of the express companies. Such travelers' notes are sometimes designated circular notes.

CRÉDIT FONCIER, krá'dé' fôn'syá' (Fr., landed credit). The French name for a method of borrowing money on the security of landed property which is widely practiced in France and other Continental countries. The borrower takes a loan, in return for which he contracts to make certain annual payments, which are so adjusted as to make provision for the interest and for the gradual extinction of the principal, which is fully paid when the term of the contract has been concluded. These contracts are generally made with companies organized for the purpose of loaning their capital in this fashion. Another variety of this form of credit is found in the *Pfandbrief* institute of the large landowners of Germany. Loans are made in the same way, but in return for the debt the borrower receives the securities of the association. He does not actually contract a debt until he sells these securities, which he may do in whole or in part.

CRÉDIT MOBILIER, krá'dé' mó'bé'yá'. A well-known financial institution of France. On November 18, 1852, the French Government sanctioned the statutes of a new bank under the name of the Société Générale du Crédit Mobilier, with a capital of 60,000,000 francs. The name was intended as a contrast to the Société du Crédit Foncier, which are of the nature of land banks, and advance money on the security of real or immovable property, while the Crédit Mobilier proposed to give similar aid to the owners of movable property. The declared object of the new bank was especially to promote industrial enterprises of all kinds, such as the construction of railways and the opening of mines, by placing loans and handling stock. Various privileges were conferred upon it under its charter; among others it was allowed to acquire shares in public companies, and to pay calls made upon it in respect of such shares by its own notes or obligations; also to sell or give in security all shares thus acquired. The operations of the society were conducted upon a very extensive scale. In 1854 it subscribed largely to the Government war loan, raised during the Crimean campaign, to the Grand Central Railway Company, to the General Omnibus Company of Paris, and to

various other important undertakings. The dividend declared for 1854 was 12 per cent. In 1855 it loaned two sums to the Government—the one of 250,000,000 and the other of 375,000,000 francs. Its operations were vast during this year, and the net dividend declared amounted to 40 per cent. The directors then proposed to avail themselves of their privilege of issuing their own obligations, and thought to issue two kinds of notes—the one at short dates, the other at long dates, and redeemable by installments. The proposed issue was to amount to 240,000,000 francs; but the public became alarmed at the prospect of so vast an issue of paper money, and in March, 1856, the French Government deemed it necessary to prohibit the carrying out of the proposed scheme. This was a severe blow to the institution. In 1856 its dividends did not exceed 22 per cent.; in 1857 they were only 5 per cent. Several attempts to resuscitate its credit failed, and finally, in November, 1871, it was reorganized and put under a new board of management. In 1877 its assets were 77,000,000 francs, but its shares, the par value of which was 500 francs, sold for 200 francs only. In 1878-79 the capital was first reduced to 32,000,000 francs, and then raised to 40,000,000. In 1884 it was a second time reduced to 30,000,000 francs, but the company never regained its lost ground. The Crédit Mobilier was undoubtedly useful in developing the industrial power of France, but its operations were hazardous, and had they not been checked in time, they would in all probability have ended in disaster. See **CRÉDIT MOBILIER OF AMERICA**.

CRÉDIT MOBILIER OF AMERICA. A joint-stock company, whose alleged corrupt operations in connection with the building of the Union Pacific Railroad gave rise, in 1872-73, to the greatest Congressional scandal in American history. The company was chartered as the 'Pennsylvania Fiscal Agency,' in 1859, was organized for a general loan and contract business in 1863, and was reorganized under the above name in 1867, for the purpose of building the Union Pacific. This work, completed in 1869, was paid for largely in stock and bonds of the Union Pacific, so that the stockholders of the two companies soon came to be identical. The Mobilier stock, at first almost worthless, soon began to pay enormous dividends; suspicions were aroused; and in the Presidential campaign of 1872 the company was charged with gross dishonesty, and many prominent Republicans, including the Vice-President, the Speaker of the House, three Senators, and a number of well-known Representatives, were freely accused by the Democratic press of having been bribed in 1867-71 to use their influence and votes in favor of the Union Pacific, the alleged bribes having consisted of the sale of Mobilier stock to the accused at prices below its actual value. A prolonged investigation, conducted in 1872-73 by special committees in both the Senate and the House, resulted in a recommendation of the expulsion of one Senator, upon which, however, no action was taken, and the censure of two Representatives, Oakes Ames, of Massachusetts, and James Brooks, of New York, respectively for having sold Crédit Mobilier stock to members of Congress 'with intent to influence the votes of such members,' and for having, indirectly, received such stock. The scandal caused intense excitement throughout the country, and

the Mobilier Company met with almost universal execration; but subsequent investigation has shown that the charges were greatly exaggerated, and were at least never conclusively proved. Consult: Crawford, *The Crédit Mobilier of America, Its Origin and History* (Boston, 1880); and Hazard, *The Crédit Mobilier of America* (Providence, 1881), the latter being a paper read before the Rhode Island Historical Society in February, 1881.

CREDITON, or **KIRK'TON**. A market-town of Devonshire, England, on the Creedy, a tributary of the Exe, eight miles northwest of Exeter (Map: England, C 6). It lies in a narrow vale between two steep hills. Its chief industry is the manufacture of boots and shoes, but it has also chemical manufactures. Crediton was the birthplace of the Anglo-Saxon Winfred, or Saint Boniface. It was the seat of the bishopric of Devonshire until 1050, when the see was removed to Exeter. Population in 1891, 4359; in 1901, 3974.

CREDITOR (Lat. *creditor*, one who trusts, from *credere*, to trust). In its broadest sense, any person in whose favor a legal obligation exists, whether that obligation arises from the mutual assent of the parties, as in the case of *contract* (q.v.), or from a rule of law, as in the case of a *tort* (q.v.). The term is ordinarily applied, however, in legal usage only to him who has voluntarily given credit to another.

A *general* (simple or unsecured) creditor is one who has no *lien* (q.v.) on any property, and has only a personal claim or right of action against the debtor. If a lien on property has been given to him by way of collateral security, mortgage, or pledge, he is called a *secured* creditor. If the debtor or the law secures a priority to one creditor, or to a class of creditors over others, such favored ones are said to be *preferred creditors*. In the absence of statutory provision to the contrary, a debtor may pay one creditor in preference to others, or he may make an assignment for the benefit of creditors, and direct that one or more shall be paid in full before anything is paid to the others.

The common law gave certain creditors a priority over others. For example, creditors of a deceased person were to be paid out of his estate in the following order: (1) those having claims for funeral and probate expenses; (2) the State; (3) judgment creditors; (4) landlords having claims for rent, and bond creditors, that is, those who held bonds or sealed contracts of the deceased; (5) creditors by simple contract. This order has been modified to some extent by statute in the different States, and such legislation must be examined for detailed information on this point. The insolvency statutes of some States give a preference to the employees of an insolvent debtor over other creditors. Under the United States Bankruptcy Law of 1898, a preference given by the bankrupt to a creditor within four months before the institution of bankruptcy proceedings may be avoided by the trustee in bankruptcy; but the act secures a preference to workmen, clerks, or servants for wages earned within three months before the commencement of proceedings, not to exceed \$300 to each claimant.

When a person obtains a judgment for money against another, he is called a judgment creditor; and if an execution is issued and levied, he becomes an execution creditor. See **CONTRACT**; **AR-**

REST; **ATTACHMENT**; **DEBTOR**; **COMPOSITION**; etc., and consult the authorities there referred to.

CREDNER, kräd'nür, KARL FRIEDRICH HEINRICH (1809-76). A German geologist, born at Waltershausen (Saxe-Coburg-Gotha). He studied at the universities of Freiberg and Göttingen, and in 1836 was appointed by the Ducal Government warden of the mint. In 1839 he became surveyor of mines, in 1850 mining councillor, and in 1854 State and mining councillor. He was in 1858 appointed by the Government of Hanover superior mining councillor and reporting councillor to the Finance Ministry, in which capacity he had under his supervision all the Hanoverian mining works, including the important ones of the Harz. From 1868 until his death, he was mining privy councillor and director of mining in the Halle district. As a scientist, he was known for his study of the geology of those regions of Germany connected with his duties in the mining industry. He discovered a compound of oxides of copper and manganese, called in his honor Crednerite, and published some valuable treatises, including *Versuch einer Bildungsgeschichte der geognostischen Verhältnisse des Thüringer Waldes* (1855), and *Ueber die Gliederung der oberen Juraformation und die Wälder-Bildung im nordwestlichen Deutschland* (1863).

CREDNER, HERMANN (1841—). A German geologist, son of the preceding, born at Gotha, and educated at Clausthal, Breslau, and Göttingen. He has made extensive geological investigations in North and Central America (1864-68), the results of which were published in the *Zeitschrift der Deutschen Geologischen Gesellschaft*, and the *Neues Jahrbuch für Mineralogie*. In 1870 he became professor of geology at the University of Leipzig, and director of the Geological Commission for the Kingdom of Saxony. In addition to a geological chart of the Kingdom of Saxony (1877 et seq.), and numerous works on the geological formations of that country, his works include *Elemente der Geologie* (8th ed., 1897).

CREDULOUS, JUSTICE, and Mrs. BRIDGET. In Sheridan's farce *Saint Patrick's Day*, an ignorant, good-natured couple. The wife is a person of the Mrs. Malaprop type, and at times very amusing.

CREE, krē (possibly a corruption of *creek*). One of the largest and most important tribes of Algonquian stock, living chiefly in the British American territories of Manitoba, Assiniboia, Saskatchewan, about Lake Winnipeg and the Saskatchewan River. They are on friendly terms with the Assiniboin, but until brought under Government control were constantly at war with the Sioux and Blackfeet. They have numerous bands, commonly grouped under two main divisions, viz. Plains and Wood Crees. Soon after obtaining firearms from the traders, they began a war of conquest against the weaker Athabaskan tribes, as far even as the Great Slave Lake and the Rocky Mountains, but afterwards retired to their present position. In language and customs they differ but little from the Ojibwa, to whom they are closely related. They number now probably 10,000, on several reservations within the territories mentioned.

CREECH, THOMAS (1659-1700). An English translator. He was educated at Wadham

College, Oxford, elected fellow of All Saints College in 1683, and was head master of Sherborne School from 1694 to 1696. He afterward returned to Oxford, and, in a state of melancholy, committed suicide. Creech was a man of solid learning. He translated Lucretius (1682); Horace (1684); elegies of Ovid, two eclogues of Vergil, some of Plutarch's *Lives*, Theocritus, thirteenth satire of Juvenal, etc. The *Lucretius* was long ranked by the side of Dryden's *Vergil* and Pope's *Homer*.

CREECH, WILLIAM (1745-1815). A Scottish publisher and author. He was born in Edinburgh, and in 1770 was the traveling companion of Lord Kilmaurs, afterwards Earl of Glencairn, on the tour of that nobleman through central and western Europe. His publisher's shop in Edinburgh was much frequented by men interested in literary pursuits, and his morning 'levees,' at which he was accustomed to entertain the most distinguished authors of the Scottish capital, became exceedingly popular. Among the works published by him were those of Burns, Blair, Beattie, Cullen, Mackenzie, and other notables of the time. Burns's well-known poem *Willie's Awa'* was addressed to him.

CREEDE. A city and county-seat of Mineral County, Col., about 300 miles southwest of Denver; on the Denver and Rio Grande Railroad (Map: Colorado, D 3). It is in a narrow gulch on Willow Creek, high up among the mountains, and is engaged exclusively in mining, having a number of highly productive silver-mines. Wagon Wheel Gap, Hot Springs, and Antelope Springs are of scenic interest, and make the region attractive for tourists. Creede was founded in 1890 by N. C. Creede, who had established a mining claim there the previous year. Numerous successive strikes of amazingly rich silver deposits gave the city a wide reputation for a time. It was nearly destroyed by fire in 1892, the year of its incorporation. Population, in 1900, 958.

CREED MOOR. A village on Long Island, now included in New York City, 13 miles east of the borough of Manhattan (Map: Greater New York, K 5). The rifle-range located here was founded as a private enterprise by the National Rifle Association, and was later acquired by the State of New York. It is now used by the National Guard for target practice.

CREEDS AND CONFESSIONS (AS. *crēda*, OE., Fr., Prov., Port., Sp., It. *credo*, creed, from Lat. *credo*, I believe, the first word of the Apostles' and Nicene creeds). The names given to the authorized expressions of the doctrine of the Church at large, or of the several main sections into which it is divided. Such statements of doctrine sprang up naturally in the course of the Church's progress. As the simple truths taught by Christ in an informal and concrete form became the subject of thought, of argument, of controversy, they could not fail to receive a more definite intellectual expression, and to be drawn out into more precise dogmatic statements. Men's minds could not be exercised on subjects of such vast importance to them without this result; and the great creeds, as they rise in succession before us, and mark the climax of successive controversial epochs in the Church, are nothing else than the varying expressions of the *Christian consciousness and reason*, in their efforts more completely to realize, comprehend, and express

the originally simple elements of truth as they are recorded in Scripture. The study of the creeds would be nothing else than the study of theology in its highest historical development—in its reflex settlements after the great agitations of Christian thought had run their course.

Corresponding to this view, we find that the creeds of Christendom grow in complexity, in elaborate analysis and precision of doctrinal statement, as they succeed one another. The first are comparatively brief and simple in sense and form; the last are prolix and largely didactic. From the Apostles' Creed to the decrees of the Council of Trent, or the chapters of the Westminster Confession of Faith, there is a wide change, during which the Christian consciousness has grown from a childlike faith to a body of comprehensive critical opinions.

What has been called the Apostles' Creed has been referred by tradition to the Apostles themselves. The present text may be traced back to about the year 500, but evidently depends upon a still earlier and simpler form. This earlier form, which is called by scholars 'The Old Roman Symbol,' was in use in the Roman Church between the years 150 and 175, and was originally written in Greek. According to McGiffert (*The Apostles' Creed*, New York, 1902), it ran as follows: "I believe in God the Father Almighty and in Christ Jesus His Son, who was born of Mary the Virgin, was crucified under Pontius Pilate and buried; on the third day rose from the dead, ascended into Heaven, sitteth on the right hand of the Father, from whence He cometh to judge the quick and the dead; and in the Holy Ghost, and resurrection of the flesh." This shorter Roman symbol appears to be the root from which the later-received Roman text sprang, as well as the numerous other texts which are found, with various differences, greater or smaller, among the other Churches of the Occident. The interesting question as to its relation with the Oriental texts throws light on its own origin. The distinction must at once be made between various forms of *confession* used at baptism, and the proper, much briefer, 'rule of faith,' or *creed*. Oriental *confessions* display great variety of form, and great freedom in the choice of matter. The Eastern churches had no tradition, such as was prevalent at Rome, that the Apostles themselves composed the creed, and hence felt at liberty to modify it as was convenient. Hence, historical portions were replaced by dogmatic additions were made here and there, various heresies were noted. All, therefore, became subjective, reflective, dogmatic in character, though in different degrees. Yet at the basis of all the forms there lay a single original, which agreed substantially with the shorter Roman text. The two chief forms, Oriental and Occidental, are twin forms, with mesential variations. Carrying the investigation now still further back, by the study of the forms of the baptismal confessions found in Irenæus, Tertullian, Hippolytus, and Cyprian, we find that the earliest creed must have had all three of the members of the present creed, must have been thought of as an enlargement of the command in Matthew (xxviii. 19) to baptize all nations, and must have contained the portions as to the 'Church,' the 'resurrection of the flesh,' the 'return to judgment,' and the 'crucifixion under Pontius Pilate,' but no anti-gnostic passages. We must put the date

back, therefore, to 175. But it must go still earlier, because of the lack of 'maker of heaven and earth,' etc., which were directed against the heresiarchs who began to come to Rome as early as 110. Hence, we must put the date at least as early as about 133. That the creed was brought to Rome from the Orient is probable, but not capable of proof. Consult: Harnack, in Herzog, *Apostolisches Symbolum*; also his *Geschichte der altchristlichen Litteratur* (Leipzig, 1893).

The *Nicene*, or rather the Niceno-Constantinopolitan creed, is the next great expression of doctrinal truth that we meet in the history of the Church. It sprang out of the conflict, which had begun even in the second century, as to the dignity and character of Christ. From the beginning, Ebionitism had looked upon Christ as merely a Jewish teacher of distinction; Theodotus and Artemon openly taught such a doctrine in Rome toward the close of the second century. Others, on the contrary, taught a doctrine which identified Christ with God absolutely in such a manner as to destroy all distinction of persons in the Godhead. Monarchianism, as it was called, which held rigorously and formally to the unity of God, was the ruling principle of both doctrines, opposite as were the expressions it assumed in the two cases.

The controversy thus begun in the second, perpetuated itself in the third century, under various modifications. Paul of Samosata carried out the Unitarian tendency, which reduced Christ to the level of a mere man; Sabellius carried out the same tendency in the opposite direction, which made Christ not merely divine, of the same substance with the Father, but looked upon Him as merely a manifestation of the Father, without any distinct personality. Sabellianism recognized a Trinity of manifestations, but not a Trinity of essences. God was one and all-comprehending, and the Son and the Spirit were merely names or expressions for the different modes in which He successively reveals Himself. Sabellius flourished about the middle of the third century, and Paul of Samosata somewhat later. Arius, who was a presbyter of Alexandria, grew up in the midst of these influences, and soon distinguished himself in the Alexandrian Church by his advocacy of the doctrine that Christ, although in a true sense divine, or the Son of God, was yet not the very God. He denied that He was 'of the substance of God,' or 'without beginning'; He was only the highest created being, 'promoted' to divinity, but not the same in substance with the Father, nor equal with Him in power and glory. Athanasius came forward as the opponent of Arius, and the contest between them raged keen and wide throughout the Church.

The Council of Nicæa was summoned in 325 by Constantine, with the view of settling this controversy; and the Nicene Creed was the result. There were thus three parties in the council—the Athanasians, or extreme orthodox party; the Eusebians, or middle party; and the Arians, or heretical party. The heretics were few in number, and possessed but little influence; but the Eusebians were a strong party, and for some time resisted certain expressions of the orthodox or Athanasians, which seemed to them extreme and unwarranted; but at length the Homoiousians, as they were called, carried the day; and Christ was declared not merely to be of *like* substance

(*homoiousios*), but of the *same* substance (*homoousios*) with the Father.

The creed was formed by extending the Apostles' Creed to include the new definitions. The essential parts are: "And [I believe] in one Lord Jesus Christ, the only-begotten Son of God; begotten of the Father before all worlds, Light of Light, very God of very God, begotten not made, consubstantial [of one substance, *homoousios*] with the Father." The Council of Constantinople (381) simply reaffirmed this creed. Later the so-called Niceno-Constantinopolitan Creed arose by the incorporation of the Nicene Creed in the baptismal confession of the Church at Jerusalem, and was erroneously recognized by the Council of Chalcedon as the creed of Constantinople. It adds definitions as to the Holy Spirit, "Lord and Giver of Life, proceeding from the Father [Latin form adds "and the Son" (see *FILIOQUE*)], who with the Father and Son together is worshiped and glorified, who spake by the prophets." It also adds the word 'one' to the definitions of the Church and of baptism, putting the latter, "We confess one baptism for remission of sins."

The Christological controversies produced the council and creed of Chalcedon in 451. (See *CHRISTOLOGY*.) This creed pronounced in the most decided and elaborate way for the full and unchanged divinity and humanity of our Lord, these two natures being comprised in the unity of one person. It thus defined the elements of the doctrine of the person of Christ, and became one of the great doctrinal councils of Christian history, if not the greatest after Nicæa.

The next remarkable monument of doctrinal truth in the Church is what is called the *Athanasian Creed*, a product of the fifth century, much later than Athanasius himself, but representing, with great formal minuteness and fidelity, his doctrine of the Trinity, as apprehended and elaborated by the Western Church. See *ATHANASIAN CREED*.

The Apostles', the Nicene, the Chalcedonian, and the Athanasian may be said to form the great Catholic creeds of the Church. After the time of the last-mentioned formula, there is no general symbol of faith that claims our attention till the period of the Reformation. Theology continued to be cultivated during the Middle Ages, and especially during the twelfth and thirteenth centuries, with great assiduity. Scholasticism is nothing else than the vast expression of the intellectual labor bestowed upon this subject during these ages, when scarcely any other subject can be said to have engaged men's minds. It was characteristic of scholasticism, however, to work mainly upon the doctrinal *data* already adopted and authorized by the Church, developing these data in endless sentences and commentaries. There was, withal, no real freedom of inquiry, nor life of speculation. But as soon as the eye of free criticism and argument was turned upon Scripture with the Reformation, new creeds and confessions began to spring up. On the one hand, Protestantism had to defend its position and its scriptural authority by appeal to its system of belief; and, on the other hand, the Church of Rome, after many delays, gave forth at the Council of Trent (1545-63) a more extended and detailed statement of its doctrine than was to be found in any previous creed. The *decrees of Trent*, with the additions made in

1854 and 1870, are the fixed authoritative symbol or confession of faith of the Church of Rome.

Of the Protestant churches, the most notable confessions of faith are the Lutheran; the Continental Calvinistic or Reformed; the Anglican, or Thirty-nine Articles of the Church of England; and the Puritan, or Westminster Confession of Faith.

The Lutherans call their standard books of faith and discipline *Libri Symbolici Ecclesie Evangelicæ*, and reckon among them, besides the three Catholic creeds, the Augsburg Confession, 1530 (q.v.), the Apology for that confession by Melancthon, the Articles of Smalkald drawn up by Luther, 1537, Luther's catechisms, 1529; and in some churches, the Formula of Concord, 1576, or the Book of Torgau.

Of the Continental Calvinistic or Reformed churches, there are numerous confessions, the principal of which are: (1) The Helvetic Confessions, that of Basel, 1530, and Bullinger's *Expositio Simplex*, 1566; (2) The Tetrapolitan Confession, 1531; (3) The Gallic Confession, 1559; (4) The Palatine or Heidelberg Confession, 1575; (5) The Belgic Confession, 1559.

The *Thirty-nine Articles* of the Church of England have been already described. (See ARTICLES, THE THIRTY-NINE.) They were originally forty-two, and are supposed to have been chiefly composed by Crammer. In 1571 they were revised and approved by Convocation and Parliament. The Lambeth Articles, 1595, and the Irish Articles, 1615, became of great importance as affecting essentially the contents of the next great creed, the Westminster Confession of Faith. This was the product of the great Puritan agitation of the seventeenth century. As soon as the Long Parliament assembled in 1640, it set itself to consider the question of the reformation of religion. It carried resolution after resolution directed against the existing government of the Church of England; and at length, on the 23d of November, 1641, it passed the famous remonstrance, in which it proposed that, "in order the better to effect the reformation in the Church, there should be a general synod of grave, pious, learned, and judicious divines, who should consider all things necessary for the peace and good government of the Church." Out of this proposal sprang the Westminster Assembly, although the Parliamentary ordinance actually summoning the Assembly was not issued until a year and a half later, viz., June 12, 1643. According to this ordinance, the Assembly was to consist of 121 clergymen, assisted by ten lords and twenty commoners as lay assessors. Many of these appointed members, however, never took their seat in the Assembly. The bishops were prevented from doing so by a counter ordinance of the King.

Among the most notable divines who did assemble were Burgess, Calamy, Gataker, and Reynolds, and Gillespie, Henderson, Baillie, and Samuel Rutherford, the commissioners from Scotland, of the Presbyterian party; Goodwin, Nye, and Burroughs, of the Independent party; and Lightfoot and Coleman, with Selden, of the Erastians. The Presbyterians greatly predominated, and the acts of the Assembly bear throughout the stamp of Calvinistic Presbyterianism. It began its sittings in the autumn of 1643, and sat till February 22, 1649, having lasted upward of five years and a half. During this period it had met 1163 times.

The most important labors which it achieved were the directory of public worship and the Confession of Faith. This later document was completed in the third year of its existence (1646), and laid before Parliament in the same year. It was approved by the General Assembly of the Church of Scotland in 1647, and again in 1690, on the renewed establishment of Presbyterianism after the revolution.

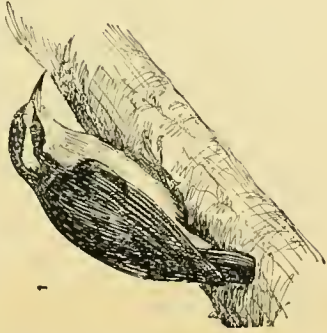
The Confession of Faith is the latest of the great Protestant creeds, and the creed of the Presbyterian churches throughout the world. It is also one of the most elaborate of all creeds. It extends to thirty-three chapters, beginning with *Holy Scripture*, and ending with *The Last Judgment*. Of its thirty-three chapters, twenty-one may be said to be distinctly doctrinal—the first nineteen and the last two. The others concern such subjects as *Christian Liberty*, *Religious Worship*, *Oaths and Vows*, the *Civil Magistrate*, the *Church*, the *Sacraments*, *Synods and Councils*. The tone of the doctrinal chapters is that of the later and formal Calvinism which spread from Holland among the English Puritans. The ecclesiastical spirit is Puritan-Presbyterian. "God alone" is declared to be "Lord of the conscience"; yet the "publishing of opinions contrary to the light of nature, or to the known principles of Christianity," is at the same time declared to be matter of censure by the Church, and of punishment by the civil magistrate. In composition, the Confession is an able and comprehensive summary of theological truth, showing great logical skill in the deduction of particular doctrines from certain main principles. The third chapter, *Of God's Eternal Decree*, may be said to be the key-note from which its most characteristic doctrines follow in immediate sequence and harmony. It is not only a remarkable monument of Christian learning, but the most representative expression of a great spiritual movement which has deeply tinged the national thought of Great Britain, and modified the course of its history. See COVENANTS.

The work of forming creeds did not, however, cease with Westminster, but many creeds of less importance have been produced since, and will continue to be produced in consequence of the changing conditions in which the Church labors. Thus, the great Methodist revival in the eighteenth century led to a revision of the Articles of the Church of England for the use of the newly arisen body; the Unitarian controversy in New England at the beginning of the nineteenth, to the formation of many more or less elaborate Church and Seminary creeds. The Congregationalists of America put forth a new creed in 1883, the Presbyterians of England one in 1900, and the Northern Presbyterian Church of the United States in the General Assembly of 1902 adopted the revision of certain articles of the Confession of Faith and a declarative statement of sixteen articles, which was substantially a new creed. The best work on the subject is: Schaff, *Creeds of Christendom* (New York, 1877-78), history and texts.

CREEK CHUB. The horned dace. See DACE.

CREEKS (so called from the numerous creeks running through their land), or MUSCOGEE, *mūs-kō'jē* (Algonquin *maskoki*, creeks). An Indian confederacy, formerly holding the greater portions of Alabama and Georgia, and second in importance among the Gulf tribes only to the

CREEPERS



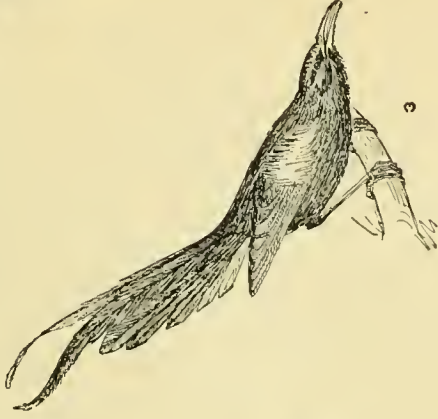
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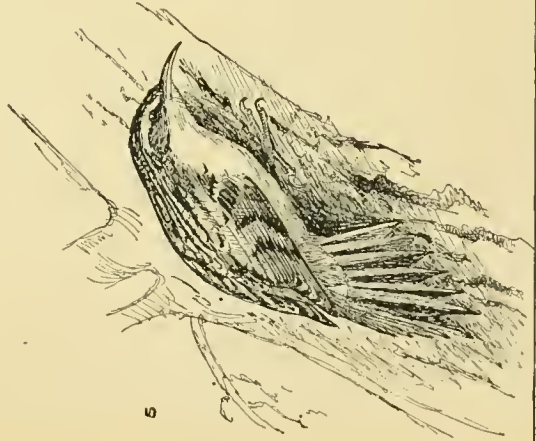
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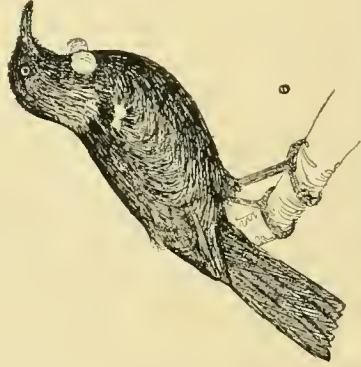
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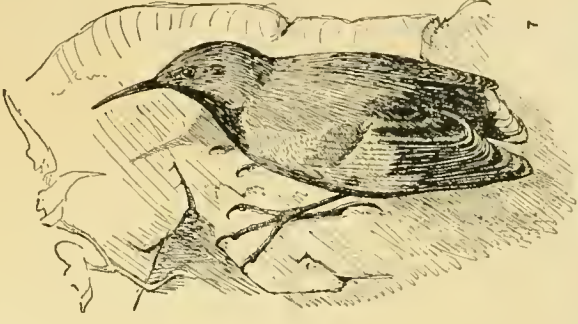
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1. BANANA QUIT (*Cereba Bahamensis*).
2. NATAL COLLARED SUNBIRD (*Cinnyris collaris*).
3. HAWAIIAN OO (*Acridocercus nobilis*).
4. SLENDER-BILLED HONEYEATER (*Acanthorhynchus tenuirostris*).
5. AMERICAN BROWN CREEPER (*Certhia Americana*).
6. PARSON-BIRD (*Prosthematomera Novae-Zealandiae*).
7. ALPINE WALL-CREEPER (*Tichodroma muraria*).

Cherokee. The ruling tribe was the Muscogee, whose language was the court language, besides which there were the Alabama, Hitchitee, Koasati, and others of the same Muskogean stock, with the Uchee and Natchez (q.v.), and a considerable incorporated band of Shawano. The Seminole of Florida were an offshoot from the Muscogee confederacy. They were agricultural, but warlike, living in villages of log houses, plastered on the outside with clay, and arranged in a rectangle about a central space reserved for public ceremonies, chief of which was the annual 'buck,' or green-corn 'dance. In the Colonial wars, and during the Revolution, they generally adhered to the English side. They made a treaty of peace with the United States in 1790, but in 1813, instigated by the English, again took up arms against the Americans, beginning hostilities by the terrible massacre of Fort Mims. They were completely crushed by General Jackson in a brief but bloody campaign, in three battles in which they lost respectively 200, 300, and 800 warriors killed. Utterly broken, the Creeks were compelled to sue for peace, which was granted only on submission to a peremptory 'demand' for the surrender of more than half their ancient territory. Other cessions quickly followed, until in 1832 they sold all their remaining territory and agreed to remove beyond the Mississippi to their present habitat in the Indian Territory. Like the other Southern tribes, they were divided in sentiment during the Civil War, and suffered severely in that struggle. Under the name of the 'Creek Nation' they conduct an autonomous government, similar in form to that of the Cherokees (q.v.). The nation numbers 16,000 citizens, of whom about two-thirds are of pure or mixed Creek blood.

CREELMAN, JAMES (1859—). An American editor and newspaper correspondent, born in Montreal, Canada. He was first associated with the New York *Herald* (1877), and eventually became editor of its London and Paris editions. During the war between China and Japan, he was correspondent for the New York *World*, and in the Turco-Greek War did similar work for the New York *Journal*, which paper he also represented at Santiago during the Spanish-American War, where his gallant conduct met with wide and well-deserved recognition. He was a voluntary aide on General Lawton's staff during the Philippine insurrection. His publications include: *On the Great Highway: Wanderings and Adventures of a Special Correspondent* (1901), and *Eagle Blood* (1902).

CREEP (from *creep*, AS. *crēopan*, Icel. *krjapa*, OIIG. *chriochan*, Ger. *kriechen*, to creep). A miner's term for the depression which takes place in underground workings from the removal of beds of coal or ore. Masses of the coal-seam, like huge pillars, are left by the miners for the support of the superincumbent strata; the pressure, however, of these beds is so great that, in course of time, the roof gradually sinks, or, as is more frequently the case, because of the roof consisting of hard rock, the softer shale pavement rises up, until the intervening spaces between the pillars, left by the removal of the coal, are filled up. A consequent depression takes place in the beds above, as also an alteration of the surface level. But this, being so gradual, is seldom noticed, except when it is made evident from the

accumulation of surface-water, or in districts where railways pass over the coal-fields. The term is also used in geology to designate the movement of soil or rock outcroppings down a slope.

CREEPER. A name very generally applied to any bird, especially if of small size, which seeks its food by running or creeping about upon the trunks of trees. It is more properly applied to the members of the family Certhiidae and especially of the genus *Certhia*. They have a slender, arched, and pointed bill; a long, narrow, sharp-pointed tongue, jagged near its tip; the tail rather long, and the tips of the tail-feathers firm and pointed, extending beyond the webs. The feet are rather slender; the hinder toe about as long as the other toes. Of this conformation of feet and tail great use is made in climbing trees, the stiff feathers of the tail being employed for support. They display great agility in clambering, often back down, about the branches, and probe every cranny for hiding insects or insect-eggs. They make their nests in crevices in trees, old woodpeckers' holes, etc. Although the family is large, it is doubtful if the genus contains more than one true species, the common streaked-brown creeper (*Certhia familiaris*), a bird found in all temperate parts of the Northern Hemisphere, wherever wood abounds. In the United States the word creeper is very generally used as a part of the name of several warblers, as the pine-creeper (*Dendroica pinus*) and the black-and-white creeper (*Mniotilta varia*). In Jamaica the name is given to a small species (*Certhiola Bahamensis*), otherwise known as banana-bird, because it frequents and nests in the banana-trees. See HONEY-CREEPER; TREE-CREEPER.

CREEPING PLANTS. Plants whose stems run close to the surface of the soil and root at intervals. See STEM; VEGETATIVE PROPAGATION.

CREESE, or CREASE. See KRIS.

CREFELD, krä'fält. See KREFELD.

CREIGHTON, krä'ton, MANDELL (1843-1901). An Anglian prelate and historian. He was born at Carlisle, Northumberland, graduated from Merton College, Oxford, in 1866, with the highest honors, and continued there as tutor until 1873. In 1870 he became deacon, in 1873 priest, and in 1875 assumed the college living at Embleton in his native shire. He was appointed rural dean of Alnwick in 1879, honorary canon of Newcastle in 1882, and professor of ecclesiastical history at Cambridge in 1884. In 1891 he became Bishop of Peterborough and remained there until 1897, when he was transferred to the see of London and was made a Privy Councillor. He represented Emmanuel College, Cambridge, at the celebration of the two hundred and fiftieth anniversary of Harvard University (1886), and in 1896 attended the coronation of Czar Nicholas II, as delegate of the Church of England. As Bishop of London, which office he retained until his death, Dr. Creighton, although known as a High Churchman, acted with signal skill and impartiality in the numerous delicate questions of theological interpretation which confronted him. Besides his *History of the Papacy* (5 vols., 1882-94), which is an authority, his *Age of Elizabeth* (1876) and *Cardinal Wolsey* (1888) deserve especial mention. He was also the founder and first editor of the *English Historical Review*.

CREIL, krá'y'. The capital of a canton and an important railway junction in the Department of Oise, France, on the Oise, 32 miles north of Paris by rail. The parish church dates from the twelfth century; the ruined twelfth-century Transition Church of Saint Evremont is situated on an island in the river; and there are remains of a royal castle of Charles V. Hardware, copper, machinery, and pottery manufactures are its chief industries, and it has an increasing river-transit trade. Population, in 1901, 9125.

CREIZENACH, kri'tsc-näg, THEODOR ADOLF (1818-77). A German poet and literary historian. He was born in Mainz, the son of Michael Creizenach, a famous Hebrew scholar, studied at Giessen, Göttingen, and Heidelberg, and was one of the founders of the Jewish Reform Society in Frankfort-on-the-Main. He embraced Christianity in 1854, and in 1863 was appointed professor at the Frankfort Gymnasium. He was a versatile writer, his poems, *Dichtungen* (1839) and *Gedichte* (1851), being distinguished by simplicity and an elegiac character. His publication of the correspondence between Goethe and Marianne von Willemer (1878) is a valuable contribution to the literature on the great poet.

CRELLE, kré'le, AUGUST LEOPOLD (1780-1855). A self-educated German mathematician. He was born at Eichwerder, near Wriezen, and was an architect by profession, but is chiefly known as the founder of the *Journal für reine und angewandte Mathematik* (Berlin, 1826). This journal has given expression to many of the greatest mathematical developments of the nineteenth century. Abel's proof of the impossibility of solving the general equation of the fifth degree by algebraic methods appeared in the first volume. Steiner, 'the greatest geometrician since the time of Euclid,' was a leading contributor, and Möbius intrusted to it the publication of his most important researches. Crelle wrote quite extensively on algebra, trigonometry, the theory of numbers, the theory of functions, and various subjects of mathematical physics. His chief works are *Versuch einer allgemeinen Theorie der analytischen Facultäten* (1825); *Encyklopädische Darstellung der Theorie der Zahlen* (1843); *Sammlung mathematischer Bemerkungen* (1820-22); *Elemente der Geometrie und ebenen und sphärischen Trigonometrie* (1826-27). He was also editor of the *Journal der Baukunst*.

CRELLINGER, krä'ling-er, AUGUSTE (DÜRING) (1795-1865). A German actress, born in Berlin. She made her first appearance at the Court Theatre, Berlin, May 4, 1812, and subsequently became one of the most famous actresses of her day, and frequently appeared as a star at the leading theatres of Germany, as well as in Saint Petersburg. Sappho, Lady Macbeth, Iphigenia, Phädra, and Adelheid in *Götz von Berlichingen* were some of her favorite rôles. She excelled also in comedy parts, and was distinguished alike for her beauty, numerous histrionic accomplishments, and consummate artistic training.

CREMA, krä'má. A city in the Province of Cremona, north Italy, situated on the right bank of the Serio, 33 miles (by the winding railway) southeast of Milan (Map: Italy, D 2). The cathedral has a Romanesque façade, and the Church of Santa Maria delle Grazie has inter-

esting frescoes. The circular Church of Santa Maria della Croce, built in 1490, has an octagonal interior adorned with paintings by Campi. The chief products of the district are wine, fruit, and cheese; lace, silk, and linen goods are manufactured. Crema was founded by the Lombards in the sixth century and suffered much during the wars of the Guelphs and Ghibellines. It was besieged, taken, and destroyed by Frederick Barbarossa in 1159-60. Population (commune), in 1881, 9111; in 1901, 9755.

CREMATION OF THE DEAD (Lat. *crematio*, from *cremare*, to burn; connected with Goth. *hauri*, coal, Icel. *hyrr*, fire). The process of disposing of the bodies of the dead by reducing them to ashes. Three methods of disposing of the bodies of the human dead have prevailed since the earliest times: simple exposure; burial in the earth, in caves, or in artificial tombs; and cremation. Among the factors which have determined which of these methods should be adopted by a nation or race have been physical conditions, such as the character of the soil and climate and the abundance or scarcity of fuel; sanitary considerations; and religious beliefs. Only the most uncivilized tribes have practiced simple exposure, depending on the elements and the wild beasts to dispose of the bodies of their dead. Such was the practice of the early Colchians, who, we are told, hung dead bodies on the limbs of trees, while the Syrians abandoned their dead to wild animals.

DISPOSAL OF THE DEAD AMONG THE ANCIENTS AND AMONG UNCIVILIZED TRIBES. Of the two methods employed by civilized nations, cremation and burial, the former is the one originally prevalent among the Indo-European races. The graves of North Europe, throughout the Bronze Age, contain, not skeletons, but only urns for the reception of funeral ashes. The Egyptians, on the other hand, embalmed their dead: the Jews laid them away in sepulchres: and the ancient as well as the modern Chinese buried them in the earth. The Chinese, influenced by religious doctrine, now, as of old, insist on properly placed graves in their own land, and for this reason corpses are sent home from California. They do not have cemeteries specially set apart for the burial of the dead, but may bury them anywhere, and the frequent occurrence of these hallowed spots, which may not be desecrated, has proved a serious obstacle to railway projects. The dry, hot climate of Egypt made the embalming process possible, and the scarcity of fuel made it less expensive than burning. The same natural cause, lack of fuel, may have led to the practice of burial among the Jews and other tribes. Among the ancient Persians the bodies of the dead were exposed to the elements, as is the practice of the modern Parsis, or followers of Zoroaster. It is, however, probable that in some instances, especially in the case of kings, burial with a coating of wax was allowed. Many of the early American Indians burned their dead and disposed of their ashes in various ways, while the ancient Greeks practiced both cremation and burial, the former being introduced by the Phrygians, and burial by the Egyptians. Among the Romans, cremation was the general practice during the latter days of the Republic and through four centuries of the Empire. See BURIAL for a description of burial practices of ancient nations.

While natural causes, undoubtedly, had a great influence in determining the method of disposal, especially in very early times, religious belief in the resurrection of the physical man has usually been the chief factor which has caused the spread of the custom of interment rather than the more sanitary method of disposal by fire. The Egyptians, Jews, Mohammedans, and Christians all believe more or less fully in the physical resurrection of the body; and the question arises, whether cremation does not impair the prospect of a future life. With the spread of Christianity, burial was substituted for cremation, both in the heart of the Roman Empire and among the converted pagans on its outskirts.

Cremation was once common in England, and was but slowly supplanted by inhumation. The same is true of the Gallic and Germanic races. It is said that Charlemagne, in his zeal for Christian burial, punished the act of cremation with the death penalty. Cremation is still practiced in India and among some other Oriental nations. In Japan the Shinto sect practices burial and the Monto sect cremation.

CREMATION IN THE NINETEENTH CENTURY. In Great Britain the revival of the practice of cremation was discussed as early as 1658, when Sir Thomas Browne published his *Hydriotaphia, or Urn Burial*. In 1817 Dr. J. Jameson wrote a sketch on the *Origin of Cremation*. For many years during the early part of the century, Dr. Lord, Health Officer for Hempstead, continued to agitate the subject, but no practical results were achieved. In 1797 cremation was discussed by the French legislature under the Directory. But it was in Italy that the first practical steps were taken toward reestablishing the practice of cremation. From 1852 on, the subject was agitated in the various national scientific congresses and through their efforts the incineration of human dead was made legal by the introduction of a provision for that purpose in the National Sanitary Code. The process has since rapidly grown in favor in Italy, and, besides the private crematories, there are now municipally owned crematories in Rome, Milan, Florence, and Venice.

In Germany the subject was discussed at scientific meetings almost as early as in Italy, but greater legal difficulties were encountered here than in Italy. In 1874 the body of an Englishwoman was reduced to ashes in a Siemens furnace constructed at Dresden, and this was the first cremation scientifically performed; but the Government of Saxony, after two incinerations, forbade the practice. Soon after, legal right to construct a crematory was secured in the neighboring Duchy of Gotha, and for twelve years this was the only place in Germany where incineration could be practiced. During the closing decade of the nineteenth century crematories were put in operation in Heidelberg, Hamburg, Jena, and Offenbach.

In France, after much agitation, a law was passed in 1887, legalizing the practice. Soon after the city of Paris erected a crematory where cremation is compulsory for certain classes, including all unclaimed hospital dead, the remains from dissecting tables, and dead bodies from streets and sewers. In England, Sir Henry Thompson is widely known as the leader of the present agitation in favor of cremation. In 1874

he organized the 'Cremation Society of London,' whose object is to introduce "some rapid process of disposal which cannot offend the living and shall render the remains absolutely innocuous." Accordingly a crematory was erected at Woking, near London, and here the first incineration took place in March, 1885. Since that date several other crematories have been put in operation, including those at Manchester and Glasgow. In 1900 the city of Hull completed a crematory for general use, the first municipally owned crematory among English-speaking people. Its arrangements will be found described later in this article.

The first place in the United States where the subject of cremation was systematically agitated was the city of New York, in 1873, but it was not until 1881 that a crematory was built for the use of its population. In the meantime, a few cremations were made in private furnaces at Washington, Pa., and Salt Lake City. During the closing decade of the nineteenth century the movement grew rapidly in popularity, and the United States now ranks first in the number of optional annual incinerations. At the close of this article are appended tables showing the location of crematories and annual number of incinerations for the whole country.

ARGUMENTS FOR AND AGAINST CREMATION. Within the last few years the conviction has rapidly spread that a more rapid and sanitary method of disposal must be substituted for burial, especially in the great centres of population. To find enough land for burial purposes is becoming a more and more difficult matter. It has been estimated that 24 acres are annually required for the burial of the dead of London. If 4000 corpses are crowded into an acre, it has been estimated by the same authority that, at the mortality rate of 20 per 1000, New York, with a population of 3,000,000, requires 17½ acres annually to bury its dead. A similar computation of population, death-rate, and space required for burial will show that, unless the custom is changed, much of the available space in the vicinity of all large cities will eventually be required for burial purposes.

The sanitary objections to burial are of still greater importance than the economic difficulties. Through pollution of the air and water the presence of a crowded cemetery may become a menace to the health of the community. The development of the germ theory of disease has added to the realization of this general danger the specific fear that, in the case of those who die from communicable diseases, the germs may be conveyed through the ground from a dead victim to a living host. To what extent this is possible is still a mooted question among bacteriologists. Elaborate experiments, conducted by Pasteur, would seem to show that, in the case of animals at least, disease germs are conveyed from a buried to a living animal. It is a well-known fact that the purifying organisms, for the most part, must work near the surface of the ground, where there is a plentiful supply of oxygen, and that ordinarily bodies are buried too deep and with too many impedimenta about them to be readily acted upon. In 1900 Sir Henry Thompson, in an address before the Cremation Society of England, advocated that while cremation remained optional for ordinary cases, it should be made obligatory when death is due to such transmissi-

ble diseases as smallpox, diphtheria, scarlet fever, typhoid fever, and tuberculosis. In cases of epidemics and after battles, when there are large numbers of bodies to be disposed of at once, cremation seems especially advisable. In cities like New Orleans, where the soil is so full of water that burial is impossible, cremation seems a more natural alternative than sealing up bodies in artificial tombs, constructed above the surface of the ground.

An objection to cremation, in the minds of some, is that trace of the dead is obliterated from the sight of the living. But the condition and ultimate fate of graveyards, especially in the heart of great cities, is a proof that in many cases such memorials are but transitory. In Continental Europe an average of twenty-five years is allowed for the occupancy of a grave, after which, in most cases, the ownership reverts to the municipality and the grave may be opened again. (See CEMETERY.) In England the law permits the opening of graves after fourteen years. In London some of the abandoned cemeteries have been utilized as public parks. It is stated that about 100 graveyards have been destroyed or partially abandoned in New York since it became a city. During the construction of the Boston subway, King's Chapel burial-ground was excavated and its occupants removed. In considering the comparative merits of inhumation and incineration, it should be borne in mind that the ultimate fate of every human body is resolution into its elements.

The Boston Cemetery Board has recommended the erection of a municipal crematory for the incineration of paupers and criminals, thus doing away with the Potter's Field. It is asserted that bodies can be burned for \$1 each, while it costs about \$3 to bury them. The public burials in Boston amount to about 500 annually, and the Potter's Field is full. A public crematory is doubtless an improvement in all respects over the loathsome Potter's Field.

Aside from the sentimental objection to cremation already mentioned, the chief argument against cremation is the medico-legal one that with the burning of the body possible traces of crime are obliterated. Frederick L. Hoffman, in a paper on "Cremation as a Life Insurance Problem" (*Sanitarian* for January, 1901), calls attention to this phase of the subject and points out that 64 of the 528 persons cremated at Saint Louis, Mo., in 1895-99 died from accidents, violence, or suicide. In view of the number of murders, by poison or otherwise, that are committed to obtain insurance money, it is recommended that very special precautions be taken to ascertain the exact cause of death before issuing a permit for cremation. To meet this difficulty, the Cremation Society of England investigates the conditions of death in the case of every body for whose incineration application is made. It has also secured the services of a distinguished pathologist to make autopsies when necessary.

METHODS OF CREMATION. Among the practical methods of cremation which have been attempted may be mentioned, in the first place, the experiments of Dr. Polli at the Milan gas-works, and those of Professor Brunetti, who exhibited an apparatus at the Vienna exhibition of 1873, and described his results in *La cremazione dei cadaveri* (Padua, 1873). Polli obtained complete incineration or calcination of the bodies of dogs by

the use of coal-gas mixed with atmospheric air, applied to a cylindrical retort of refractory clay, so as to consume the gaseous products of combustion. The process was complete in two hours, and the ashes weighed about 5 per cent. of the weight before cremation. Brunetti used an oblong furnace of refractory brick with side-doors to regulate the draught, and a cast-iron dome above with movable shutters. The body was placed on a metallic plate suspended on wire. The gas generated escaped by the shutters, and in two hours carbonization was complete. The heat was then raised and concentrated, and at the end of four hours the operation was over; 180 pounds of wood, costing about 60 cents, was burned. In the reverberating furnace used by Sir Henry Thompson, a body, weighing 144 pounds, was reduced in 50 minutes to about 4 pounds of lime-dust. The noxious gases which were undoubtedly produced during the first five minutes of combustion passed through a flue into a second furnace, and were entirely consumed. In the ordinary Siemens regenerative furnace (adapted by Reclam in Germany for cremation, and also by Sir Henry Thompson) only the hot blast is used, the body supplying hydrogen and carbon, or a stream of heated hydrocarbon mixed with heated air is sent from a gasometer supplied with coal, charcoal, peat, or wood, the brick or iron-cased chamber being thus heated to a high degree before cremation begins. In one arrangement both gas and air are at a white heat before they meet and burst into flame in the furnace. The advantage of the Siemens furnace and gas-producer are that the heat of the expended fuel is nearly all retained by the regenerators, and that the gas retort admits of the production being stopped without much loss. Some difficulty has been felt about keeping the ashes free from foreign material. The Greeks used a shroud of asbestos, the Egyptians one of amianth. Mr. Eassie has suggested a zinc coffin—that metal being volatile.

At the Fresh Pond Crematory in New York City the body is removed from the coffin, which is burned separately. The body is then wrapped in an alum-soaked sheet to prevent premature ignition of the clothing and placed in a clay retort which is subjected to extreme heat. The retort is perforated to allow the gases which are generated during the early part of the process to escape into a combustion chamber, where they are burned and purified before passing off in the flues. The process of incineration requires from one to three hours, according to the size and condition of the body. The ashes weigh from one-half pound to five pounds. They are gathered from the bottom of the retort, the ashes from the clothing are fanned out, iron removed with a magnet, and the clean bone-ash sealed in a black tin canister. A columbarium or urn hall is provided, lined with niches where the ashes may be placed in suitable urns if desired. In this hall the funeral service may be held. At the crematory in Mount Auburn Cemetery, near Boston, Mass., the retorts and incinerating apparatus were designed and executed by the Engle Sanitary and Cremation Company of Des Moines, Iowa.

The first municipally owned crematorium in Great Britain was built at Hull, England, and opened for use in January, 1901. The cremating furnace is of the regenerative type and was de-

signed by the late Mr. Henry Simon, former president of the Manchester Cremation Society. It consists of three interior chambers, the two lower of which are surrounded by air-passages. The lower chamber contains a coke fire, and the upper one is for the reception of the body. The fire is lighted several hours before the apparatus is to be used, and is supplied with air in the usual way, so that by the time the apparatus is to be used the air-passages are thoroughly heated. Most of the direct air-supply is then cut off, and the partially consumed gas (carbonic oxide)

reached, it passes noiselessly, by means of invisible mechanical arrangements, through curtains into an intermediate chamber, and the curtain falls behind the coffin as it enters the cremating chamber. The charge for cremating the bodies of residents within the city is one guinea; for non-residents it is three guineas. The cost of the crematorium was about \$2500.

BIBLIOGRAPHY. A chapter on Cremation treating the subject from the sanitary and economic standpoint is contained in Baker, *Municipal Engineering and Sanitation* (New York, 1901).

CREMATIONS PERFORMED IN EUROPE AND THE UNITED STATES
(From Cobb's *Quarter Century of Cremation in North America*)
CREMATIONS IN THE UNITED STATES

CITY	1876 to 1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	Total
Baltimore, Md.							3	5	12	16	22	15	11	17	21	14	22	18	176
Boston, Mass.											1	87	88	135	160	167	230	188	1,056
Buffalo, N. Y.			1	8	17	16	23	30	38	27	30	31	41	28	44	40	43	67	484
Cambridge, Mass.																			50
Chicago, Ill.											6	42	66	54	82	130	127	188	695
Cincinnati, O.					11	21	34	45	43	34	42	38	66	46	71	59	56	81	647
Davenport, Ia.									6	7	13	8	8	9	23	17	18	24	133
Detroit, Mich.					3	10	14	24	21	33	47	22	31	29	44	51	33	56	418
Fort Wayne, Ind.														5	1	3	4	13	
Lancaster, Pa.		3	36	14	13	6	1	3	1	3	5	2	1	1	2	5	2	99	
Los Angeles, Cal.					7	5	12	17	29	41	37	38	37	37	34	58	52	52	456
Milwaukee, Wis.														21	34	30	53	40	178
New York, N. Y.			9	77	67	83	106	160	187	186	232	243	296	330	331	466	528	602	3,903
Pasadena, Cal.													4	14	13	24	31	26	112
Philadelphia, Pa.						14	28	31	51	62	68	74	88	85	78	114	106	119	918
Pittsburg, Pa.				14	9	11	8	9	13	14	13	10	13	14	16	21	19	31	215
San Francisco, Cal. (Odd Fellows)											42	111	89	69	54	62	107	98	632
Saint Louis, Mo.													68	102	211	260	347	547	1,535
Saint Paul, Minn.						24	20	42	60	64	72	87	95	86	118	109	128	149	1,054
Swineburne Isl., N.Y.															2	11	27	16	56
Troy, N. Y.							4	3		61	22	3	1	1	3	2	7	4	111
Washington, D. C.								4	10	14	15	12	10	18	14	13	20	16	146
Washington, Pa.	25	13	1	1											25	38	28	25	116
Waterville, N. Y.											1	1	4	5	6	4	6	10	41
Totals, U. S.	25	16	47	114	127	190	253	373	471	562	668	824	1,017	1,101	1,390	1,693	1,996	2,414	13,281

CREMATIONS IN EUROPE

COUNTRY	1876 to 1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	Total
Italy	319	113	164	180	168	220	282	258	221	262	246	228	220	219	242	241	265	262	4,110
Denmark											4	15	18	21	14	18	28	28	146
France						49	121	134	159	189	216	187	200	210	231	248	301	2,245	
Germany	146	69	76	95	110	95	128	111	165	221	253	267	266	312	374	423	511	639	4,261
Great Britain		3	10	13	28	46	54	99	107	131	172	209	201	250	341	367	451	2,482	
Sweden				13	23	46	38	57	52	63	49	34	61	70	73	72	70	721	
Switzerland							21	32	39	39	41	40	44	64	69	99	95	136	719
Totals, Europe	465	182	243	285	304	366	572	614	715	840	927	987	978	1,078	1,229	1,426	1,586	1,887	14,684
U. S. & Europe	490	198	290	399	431	556	825	987	1,186	1,402	1,595	1,811	1,995	2,179	2,619	3,119	3,582	4,301	27,965

from the coke is allowed to mix in the second air-chamber with the air heated by passing through the side air-passages. The incinerating chamber is thus filled with gas of an intensely oxidizing character in a state of incandescence. The degree of heat can be regulated in the most exact manner. There is no smoke and little visible flame before the body is introduced, and if the coffin is made in accordance with the regulations laid down, there is no smoke and no noise during the cremation. The process occupies about one hour, at the end of which there only remain the inorganic bases of the bones, in the form of silver-gray, pumice-like fragments. The cremating chamber is at no time visible to mourners. The coffin, when brought into the chapel, is placed on a catafalque. When the committal sentence in the religious service is

Cobb, *Quarter Century of Cremation in North America* (Boston, 1901), includes a complete history and statistics of the movement in the United States, with brief supplementary matter and tables for Europe. The book also contains a very full bibliography of the subject. Relating to the periodical literature on the subject, Mr. Cobb says: "During the period covered by this record there were published in the United States three magazines for the spread of knowledge concerning the subject. The *Columbarium* was issued from Philadelphia, *The Urn* from New York, and *The Modern Crematist* from Lancaster, Pa. . . . After a brief and valiant struggle for existence they were compelled to quit the field, and there is not to-day printed in the English language a single journal devoted to the interests of cremation."

CREMER, krá'mër, AUGUST BERNHARDT (1834—). A German Protestant theologian. He was born at Unna, Westphalia, October 18, 1834; studied at Halle and Tübingen, and since 1870 has been professor of systematic theology at Greifswald. Two of his numerous publications have been translated—his *Biblich-theologisches Wörterbuch der neutestamentlichen Grazität* (1866-67; 8th ed. 1895; Eng. trans., 1872, 3d ed. 1886), and *Ueber den Zustand nach dem Tode* (1883; 6th ed. 1901; Eng. trans. 1885).

CREMER, JACOBUS JAN (1827-80). A Dutch novelist, born at Arnheim. He studied painting before devoting himself to literature. Especially noteworthy are his rural tales in dialect, entitled *Beuwsche Novellen* (1856, and frequently reprinted), all of which are strikingly original and true to nature. His other works include: *De Lelie van 's Gravenhage* (1851); *Daniel Sils* (1856); *Anna Rooze* (1867); *Dokter Helmond en zijn vrouw* (1870). Several of his novels have been translated into German and other languages and have become widely popular.

CRÉMIEUX, krá'myč', ISAAC ADOLPHE (1796-1880). A French statesman and philanthropist, born at Nîmes, of Jewish parents, April 30, 1796. He studied law, and was admitted to the bar at Aix in 1817. About 1830 he went to Paris, where he soon became famous as an advocate, particularly in the defense of political prisoners. He entered public life in 1842 as a Deputy from Chimon, and served till 1848, sitting always on the Left. Under the Republic of 1848 he was elected as Deputy to the Constituent Assembly and the Legislative Assembly, and was one of the first seven named by the Chamber on February 24 to form the Provisional Government, in which he acted as Minister of Justice. On the night of Louis Napoleon's coup d'état (December 2, 1851) Crémieux was arrested and thrown into the prison of Mazas. He was soon released and voluntarily retired into private life until November, 1869, when he was elected a Deputy to the Corps Législatif. On September 4, 1870, he was proclaimed a member of the Government of National Defense, and the following day he was made Minister of Justice. His name is connected with many subsequent acts of legislation. He rendered the famous decree which expelled from their seat the infamous magistrates composing the 'mixed commissions' under the Empire, whose judgments had driven so many distinguished and gifted men from the country. Another decree bearing his name, the Decree Crémieux, naturalized in mass 30,000 of his coreligionists in Algeria. In 1871 he subscribed 100,000 francs toward the payment of the war indemnity for the liberation of the French territory from the Germans. He appears always as a man of the highest sense of honor. In 1875 he was elected life Senator. He was one of the founders of the Alliance Israélite Universelle (q.v.) and its president from 1863 to 1866 and from 1868 to 1880. He did much for the Jewish race the world over. He died, February 10, 1880, at Passy. Consult: Jaquet, *Les contemporains* (Paris, 1867); Blanc, *Histoire de dix ans* (Brussels, 1846).

CREMNITZ. See KREMNITZ.

CREMONA, krá-mó'ná. The capital of the province of the same name in North Italy, situated 60 miles southeast of Milan, in a fertile plain on the left bank of the Po, below the Adda

and above the Oglio (Map: Italy, E 2). It has broad but irregular streets and attractive public squares, and a bridge 3100 feet long over the Po; it is surrounded by old walls, and a partly covered canal passes through it. The twelfth-century Romanesque Lombard cathedral has a rich main façade and many frescoes by masters of the Cremona School. From the Torrazzo (397 feet), the highest clock-tower in Italy, is a view of the entire course of the Po through Lombardy. Others of the 44 (formerly 87) churches are the richly decorated sixteenth-century San Pietro al Po, the fourteenth-century Sant' Agostino e Giacomo in Braida, with paintings by Perugino and others, the sixteenth-century Santa Margherita, built and decorated by Giulio Campi, Sant' Agata with four large fine frescoes, and in a suburb San Sigismondo, with frescoes and paintings by Cremonese masters. Also noteworthy are the restored thirteenth-century city hall and the thirteenth-century Palazzo de' Gonfalonieri, and the Palazzo Reale, with natural-history and other collections. A memorial tablet marks the house where Antonio Stradivari (q.v.) made his violins. Cremonese violin-makers who preceded him were the two Amati and Guarneri. Famous painters of Cremona were Boceaccio Boceacino, Melone, Bembo, the three Campis, and Sofonisba d'Angussola, whose five sisters also practiced the art. Cremona has a seminary, a lyceum, a gymnasium, an industrial school, a technical school, two theatres, a library of 35,000 volumes, and a chamber of commerce. The town has an active trade by rail and water, markets grain, flax, cheese, etc., and manufactures silk, cotton, and wool fabrics, machinery, and earthenware. It is lighted by electricity and has a telephone system. Cremona was colonized by the Romans in B.C. 218 and grew to be an important commercial centre. It was destroyed in A.D. 70 by Vespasian, who afterwards encouraged its rebuilding. It was laid waste by the Lombards in 605. It again became important in the tenth century. In the fourteenth century it came into the possession of Milan. Population (commune), in 1881, 31,788; in 1901, 37,693. Consult Holder-Egger, "Die Annales Cremonenses." *Neues Archiv der Gesellschaft für ältere deutsche Geschichtskunde*, vol. xx. (Hanover, 1900).

CREMONA, LUIGI (1830-1903). An Italian mathematician, born in Pavia. He participated in the struggle for independence against Austria in 1848-49, later studied at the University of Pavia, obtained a mathematical professorship in Bologna, and in 1873 became professor of higher mathematics in the University of Rome and director of the engineering school of the institution. His contributions to the study of projective geometry and of graphical statics are important. He introduced these subjects into the curricula of Italian technical schools, whose organization he did much to improve. His published works include: *Introduzione ad una teoria geometrica delle curve piane* (1862); *Le figure reciproche nella statica grafica* (3d ed. 1879); and *Elementi di geometria proiettiva* (1873).

CREMORNE (kre-mörn') **GARDENS**. A famous resort in London, near Battersea Bridge, closed in 1877.

CRENEL', or **CRENELLE'** (OF. *crenel*, notch, embrasure, from ML. *crenellus*, dim. of

Lat. *crena*, notch). Any embrasure or opening in the walls of a fortified place; especially the spaces between merlons (q.v.) on a battlemented parapet, from which missiles could be discharged. Hence it is sometimes used to designate a battlement. Crenellated is used of a building supplied with crenels. See BATTLEMENT.

CRE'NIC ACID (from Gk. κρήνη, *krēnē*, fountain). One of the constituents of vegetable mold, produced wherever leaves and other plant matter are decaying, especially in peat-bogs and marshes.

CRE'ODON'TA (Neo-Lat., nom. pl. of Gk. κρέας, *kreas*, flesh + ὀδούς, *odous*, tooth). A suborder of extinct mammals, ancestral to the true carnivores, and hence sometimes called Carnivora Primigenia, and found fossil in the lower Tertiary rocks. The creodonts comprise primitive or synthetic types of animals that vary in size from that of a weasel to that of a grizzly bear, and that combine the characters of the true carnivorous families in such manner as to render determination of the taxonomic rank of any particular species a matter of some difficulty. The members of the suborder present resemblances to the bears, civets, and dogs among the true carnivores; the genus *Patriofelis* seems prophetic of the Pinnipedia, or seals, and *Mesonyx* resembles the carnivorous marsupials of Australia. The more primitive forms show characters possessed also by the Insectivora, Tillodontia, and Condylarthra. The oldest known mammal skull—that of *Triisodon* from the lower Puerco beds of the lowest Eocene of New Mexico—is placed among the Creodonta. Creodont remains are found in the lower Tertiary of Patagonia, and these are of interest because they resemble the carnivorous marsupials of Australia and New Zealand much more closely than do the North American creodonts. The range of the suborder in both North America and Europe is from the base of the Eocene into the lower Miocene. During Eocene time the creodonts played that important rôle among land animals which subsequently, during later Eocene and Miocene time, was assumed by the true carnivores. Among the more interesting and important genera are *Arctocyon*, *Hyænodon*, *Mesonyx*, *Oxyæna*, *Patriofelis*, *Stylolophus*.

BIBLIOGRAPHY. Matthew, "A Revision of the Puerco Fauna." *Bulletin of the American Museum of Natural History*, vol. ix. (New York, 1897); id., "Additional Observations on the Creodonta." *Bulletin of the American Museum of Natural History*, vol. xiv. (New York, 1901); Scott, "A Revision of the North American Creodonta." *Journal of the Academy of Natural Sciences of Philadelphia*, vol. ix. (Philadelphia, 1887). See articles on **MESONYX**; **OXYÆNA**; **HYÆNODON**; **PATRIOFELIS**; **MAMMALIA**; **TRIIODON**.

CREOLE (Fr. *créole*, Sp. *criollo*; probably a negro corruption of Sp.**criadillo*, *criado*, servant, from *criar*, to create, rear). A name properly used in the southern United States and in Latin America to designate the pure-blooded descendants of original French, Spanish, or Portuguese stock. By English writers it has sometimes been incorrectly supposed to mean a mestizo or mulatto; but it cannot properly be applied to any person of mixed race, non-Latin stock, or

European birth, neither is it used in speaking of the Canadian French.

CREOLE CASE, THE. An incident in American history, which caused some friction between the governments of the United States and Great Britain and was the occasion of an animated debate between the pro-slavery and anti-slavery elements in Congress. In 1841, 19 of the 135 slaves on board the American brig *Creole* revolted, while being transported coastwise between Hampton Roads and New Orleans, and securing control, after killing the captain and wounding several others, directed the vessel to Nassau, New Providence, where all those who had not been directly concerned in the revolt were immediately liberated by the British authorities, the others being held for trial on a charge of murder, in the local courts. Daniel Webster, who was then Secretary of State, demanded the return of the slaves, on the ground that they were legally property and were on American soil and under the jurisdiction of the United States, so long as they were under the American flag, even when on board a ship. They were never returned, however, by the British Government. The incident caused J. R. Giddings (q.v.) to offer a series of resolutions in the House of Representatives, on March 21, 1842, declaring that slavery could exist only by positive law of the separate States; that these States had delegated no control over slavery to the Federal Government, which alone had jurisdiction on the high seas, and, therefore, that slaves on the high seas became free, and the coastwise slave trade was unconstitutional. The House passed a resolution of censure, and Giddings immediately resigned, but was triumphantly reelected. His resolutions expressed the basis of one phase of the constitutional anti-slavery agitation. They are given in full in Giddings's *History of the Rebellion* (New York, 1864). The statute of March 2, 1807, regulating the coastwise slave trade, is in 2 U. S. Statutes at Large 426. See **SLAVERY**.

CREOLE STATE. Louisiana. See **STATES**, **POPULAR NAMES OF**.

CRE'OLIN (origin uncertain). An unofficial dark-brown, sirupy liquid, of tarry odor, derived from coal-tar. It is soluble in alcohol and forms a milky fluid (an emulsion) with water. Different specimens vary considerably in composition and strength, and the careless use of the substance may cause poisoning. It is a good antiseptic, particularly against organisms that bear no spores, and is a powerful deodorizer. In operative surgery, it has the disadvantage that the milky character of the solution makes it difficult to see instruments placed in it.

CRE'ON (Lat., from Gk. Κρέων, *Krēōn*). In the Greek legend, the son of Menæceus, and brother of Jocasta, wife of Laius, King of Thebes. After the death of Laius he assumed the government and offered the crown and Jocasta to whoever could free the city from the Sphinx. Oedipus (q.v.) accomplished the task, and thus unconsciously became the husband of his own mother. After his fall Creon once more assumed the rule as guardian of the sons of Oedipus, Eteocles and Polyneices (q.v.). After the death of the brothers, Creon again became king, and forbade the burial of Polyneices and the Argives. Antigone (q.v.), however, defied Creon and buried her brother's body, whereupon Creon sen-

tenced her to be buried alive. Creon's son Hæmon, the betrothed of Antigone, killed himself on her body. This is substantially the story as it appears in the plays of Sophocles. Other versions told how Creon sacrificed a son on the walls of Thebes in order to avert the fall of the city, and how later he gave his daughter Megara to Heracles, who succeeded him on the throne of Thebes.

CRE'OSOTE, or **CRE'ASOTE** (Gk. κρέας, *kreas*, flesh + σωτήρ, *sōtēr*, preserver, from σώζειν, *sōzein*, to save). An oily liquid obtained by the destructive distillation of wood, particularly that of the beech (*Fagus sylvatica* Linné, natural order Cupulifere). It is almost colorless when freshly obtained, but gradually assumes a darker color if exposed to the action of light. It has a penetrating, smoky odor and a burning taste, and is slightly heavier than water, in which it is soluble only to a very limited extent. It mixes readily with alcohol, ether, chloroform, and glacial acetic acid. It is composed mainly of *guaiacol* and *crezol* and has a high refractive power. Creosote acts as an antiseptic and has been used in the preservation of meat—whence its name. At present it is largely used in the treatment of tuberculosis with mixed infection. For this purpose it may be administered in the form of an emulsion with cod-liver oil and other substances; or else a mixture of creosote with alcohol and chloroform may be inhaled by the patient, moderate doses of pure creosote being perfectly harmless, and causing no disagreeable symptoms whatever. Creosote was first prepared by Reichenbach in 1832, and Bouchard and Pimbert were the first to apply it to the treatment of tuberculosis. It is also used in bronchitis with profuse expectoration containing the *Streptococcus bacillus*, and in fermentative dyspepsia, diarrhœa, and dysentery. The *creosote-oil* used for the preservation of timber is derived by the fractional distillation of coal-tar, constituting the fraction that distills over between 230° and 270° C. It is composed mainly of phenol (carbolic acid), *crezol*, naphthalene, and anthracene.

The 'creosote-plant' (*Larrea Mexicana*) produces a substance similar to Indian gum-lac and having a strong creosote-like odor; hence the name of the plant.

CREOSOTE-BUSH. See ZYGOPHYLLACEÆ.

CREOSOTOL, krē'ō-sō-tōl' (from *creosote* + -ol), or **CARBONATE OF CREOSOTE**. A pale-yellow sirupy liquid similar to creosote, but having less odor and taste. It is used in tuberculosis and is well borne by the stomach.

CRÉQUI, krá'ké', CHARLES, Marquis de (1578-1638). A French soldier. He was a prominent officer under Henry IV., in 1622 was appointed a marshal of France by Louis XIII., and fought with great bravery against Spaniards and Huguenots. His military ability has been highly spoken of by Saint-Simon and Voltaire. Consult Chorier, *Histoire du Maréchal de Créquy de Blanchefort* (Grenoble, 1683).

CRE'RAR, JOHN (1827-89). An American philanthropist, born in New York City. He was a merchant in New York and from 1862 in Chicago, where he became head of the firm of Crerar, Adams & Co., and an incorporator and one of the directors of the Pullman Palace Car Company. He contributed \$2,500,000 as an endowment fund for a library now known by his name, \$100,000

for a statue of Abraham Lincoln, and bequeathed \$1,000,000 to charitable and religious organizations.

CRE'SAP'S WAR. See DUNMORE'S WAR.

CRESCEN'DO (It., increasing, pres. part. of *creocere*, from Lat. *creocere*, to grow). In music, a gradual increase of the volume of sound, or change from *piano* to *forte* and *fortissimo*. It is marked thus <, or with the abbreviation *crese.* The even swell of an organ produces a most perfect crescendo.

CRESCENT (from Lat. *creescens*, pres. part. of *crecere*, to grow). (1) A representation of the half-moon with the horns turned upward, called a crescent, is often used as an emblem of progress and success. It is generally spoken of as 'the arms' of the Turkish Empire; but is more properly the emblem of the empire and people. It was, however, a Byzantine emblem before the Turks assumed it on the capture of Constantinople in 1453; and at the present day is frequently to be seen on churches in Moscow and elsewhere in Russia, generally surmounted with the cross, marking the Byzantine origin of the Russian Church.

(2) A Turkish musical instrument introduced into the German military bands at the time of the Turkish wars, and now in general use in military music. It consists of a staff surmounted by a cap, and supporting several crescent-shaped brass plates, upon each of which little bells are hung. The instrument is played by being jingled in time with the music.

(3) In heraldry, the crescent is used both as a bearing or charge, and as a difference, or mark of cadency. In the latter case, it designates the second son, and those that descend from him. See **CADENCY**.

CRESCENT, ORDER OF THE. A Turkish order of knighthood. It was founded by Selim II. in 1799 after the battle of Abnkir, to be conferred on Christians for service to the Turkish State. Nelson was the first man to receive the honor. The order became extinct after half a century. An Order of the Crescent was founded by Saint Louis of France in 1269, and twice reestablished by the House of Anjou, reigning in Sicily and Naples. This is also extinct. The crescent and the star in white upon a red background constitute the Turkish flag. It is supposed that the appearance of the crescent in the horoscope of the great Othman led to the acceptance of it as the national symbol.

CRESCENT CITY. A name applied to New Orleans, because of its situation on a bend of the Mississippi River. The modern growth of the city has made the designation less applicable.

CRESCENTIIS, krēs-sēn'shī-is, **PETRUS DE**, or **CRESCENZI**, krá-shān'zē, **PIETRO** (c.1230-c. 1310). An Italian agricultural writer, the founder of modern agronomy in Europe. He was born in Bologna, but later sojourned in various cities of Italy, where he frequently acted in the capacity of judge lateral to the podestàs. Upon his return to Bologna after an absence of thirty years, during which he made valuable observations on agriculture, he published his famous work, entitled *Ruralium Commodorum Libri XII.* (1471). This work has been frequently reprinted and has been translated into Italian, German, and French. The genus *Cres-*

centia was named by Linnaeus in honor of the famous author, who was probably the first since the days of the Romans to point out the high value of agricultural science.

CRESCENTIUS, krēs-sēn'shī-ūs, JOHN (?-998). Leader (Patricius) of the national party in Rome against the authority of the Emperor in the last quarter of the tenth century. About 991, probably, Crescentius was all-powerful in Rome. With a short intermission, when Otho III. visited the city in 996, his rule lasted until 998, when he was beheaded by Otho. In 997 he had driven the Pope, Gregory V., from the city and appointed an antipope. Crescentius was long remembered as the champion of Roman liberty. Consult Gregorovius, *Rome in the Middle Ages*, vol. iii. (London, 1895).

CRESCENZI, krā-shān'zē, PIETRO. See CRESCENTIIS, PETRUS DE.

CRESCIMBENI, krā'shēm-bā'nē, GIOVANNI MARIA (1663-1728). An Italian critic and poet, born at Macerata. He received the degree of doctor of laws from the Jesuit College in his own town and then removed to Rome. Here, together with fourteen others (1690), he founded the Academy of the Arcadians, whose secretary he was for thirty-eight years. The academy was a great success, and was of great influence in counteracting the false taste of the time as embodied in Marini. Crescimbeni's most important works are: *Istoria della volgar poesia* (1698); *Commentario intorno alla volgar poesia* (1702-11); and *Trattato della bellezza della volgar poesia* (1700).

CRESCO. A city and the county-seat of Howard County, Iowa, 167 miles northeast of Des Moines, on the Chicago, Milwaukee and Saint Paul Railroad (Map: Iowa, E 1). It has extensive dairying and live-stock interests, and manufactures agricultural implements and machines, foundry products, flour, brick and tile, fire-ladders, etc. A 'Farmers' Alliance' store is successfully operated here. The water-works are owned by the city. Population, in 1890, 2018; in 1900, 2806.

CRE'SILAS (Lat., from Gk. Κρησίλας, *Krēsilas*). A Greek artist of the Attic school, born at Cydonia in Crete, who worked in the latter part of the fifth century B.C. He made a statue of Pericles, of the base of which fragments with the artist's signature have been found on the Acropolis of Athens. From this work seem to be derived the busts of Pericles in the British Museum, the Vatican, and Munich. He also made a statue of a wounded Amazon, which is probably represented by the Capitoline type. Other statues have been claimed as copies of his works, as the Munich Diomedes, and the Athena of Velletri. Consult Furtwängler, *Masterpieces of Greek Sculpture*, trans. by Sellers (New York, 1895).

CRESPI, krā'spē, GIOVANNI BATTISTA (1557-1633). An Italian painter, born in Cerano, and hence often called *Il Cerano*. He studied in Venice and Rome and established himself in Milan, where he found a patron in Cardinal Federico Borromeo. In sculpture and architecture also he was well skilled. His paintings, generally large and impressive in treatment, careful in detail, but occasionally mannered, include "Christ Appears to the Apostles Peter and Paul" (Hof-Museum, Vienna), and "The Baptism of Saint Augustin" (San Marco, Milan).

CRESPIN, krā-spān'. JEAN (c.1520-72). A French Protestant author. He was born in Arras, studied law in Louvain and Paris; became advocate in Parliament, 1540; fled on account of his religious opinions to Strassburg in 1545; removed to Geneva in 1548, and carried on the printer's trade there until his death in 1572. His fame rests upon his *Livre des martyrs* (1554), with its continuations or recastings under different names: *Recueil* (1554); *Histoire* (1570); new edition of the whole as *Histoire des martyrs* (3 vols., 1886-89). It was translated into Latin and has been the basis of many similar Protestant martyrologies.

CRESS (AS. *cressc*, *carss*, OIIG. *crecco*, *crecca*, Ger. *Kresse*; probably from OIIG. *chresan*, MHG. *kresca*, to creep). A name given to many plants, of which the foliage has a pungent, mustard-like taste, and is used as a salad. It is sometimes more strictly confined to the genus *Lepidium*, a genus of the natural order Cruciferae. The common cress or garden cress (*Lepidium sativum*) is an annual, a native of the East, frequently cultivated in European and American gardens. It is powerfully anti-scorbutic. Virginian cress (*Lepidium Virginicum*) resembles the garden cress in its properties, and is eaten as a salad, and used as a diaphoretic medicine in North America and the West Indies. *Lepidium piscidium*, a native of the South Sea Islands, is one of the plants used by sailors for prevention or cure of scurvy. The name winter cress is given to species of the genus *Barbarea*, also cruciferous biennial or perennial plants. The common winter cress (*Barbarea vulgaris*) is plentiful in moist pastures and hedge-banks throughout Europe and North America. It is occasionally cultivated as a winter salad; in Sweden it is used as a boiled vegetable. Its pungency is combined with some degree of bitterness. Very similar to this, and also occasionally cultivated, is the early winter cress, or American cress (*Barbarea praecox*), a native of Great Britain, the Continent of Europe, and North America. The common bitter cress or cuckoo-flower (*Cardamine pratensis*) is also known by the name of lady's-smock. *Cardamine amara* and *Cardamine hirsuta* are cultivated to a considerable extent in Europe, and are also found in America. Watercress (*Nasturtium officinale*) is a perennial aquatic plant, much used in the United States and Europe as a cold-weather salad. It is a native of almost all parts of the world. The leaves have a pungent, bitterish taste, with a little saltiness. The plant is of easy cultivation and grows best in clear, shallow, running water, with a bottom of sand or gravel. Mud is injurious both to its growth and to the flavor of its leaves. For Indian cress or nasturtium, see TROPÆOLUM.

CRESET (OF. *eresset*, Fr. *ercuset*, from Dutch *kruysel*, hanging lamp, dim. of *kruyse*, cup, Icel. *kräs*, Ger. *Krause*, Engl. *cruse*). A name given to a great light kindled upon a beacon or watch-tower, and also to a lamp or torch, or to a light fixed on a pole. The name owes its origin to the fact that formerly beacons were usually surmounted by a cross.

CRESSIDA, or **CRESID**. The lover of Troilus in the *Troilus and Cressida* (q.v.) of Chaucer, Shakespeare, Dekker and Chettle, and

Dryden, and a type of infidelity. The name is probably a mediæval invention representing Briseis, the daughter of Calchas, the Trojan seer.

CRESSID, or **CRESEIDE**, TESTAMENT OF, and COMPLAINT OF **CRESEIDE**. Poems by Robert Henryson, wrongly included in the earlier editions of Chaucer.

CRESSON. A pleasure resort in Cambria County, Pa., 102 miles east of Pittsburg, on the Pennsylvania Railroad. It has a fine situation, at an elevation of over 2000 feet, and is noted for pure air and the beauty of its scenery. Mineral springs add to its attractions as a resort. Population, about 800.

CRESSON, **ELLIOTT** (1796-1854). A Quaker merchant and philanthropist of Philadelphia, Pa., who devoted much attention to the emancipation of the negroes from slavery. He was president for some time of the Colonization Society (q.v.), and subsequently as its agent labored to establish the colony at Bassa Cove, on the Grain Coast, Africa.

CRESSY. See **CRÉCY**.

CRESSWELL, **SIR CRESSWELL** (1794-1863). An English jurist. He was born at Newcastle; graduated at Emmanuel College, Cambridge, in 1814, and in 1819 was called to the bar. In 1834 he was appointed King's counsel, in 1842 a puisne judge of the common pleas court, and in 1858 first judge of the newly created probate and divorce court. He was largely employed as advocate in important navigation and mercantile cases.

CREST (OF. *creste*, Fr. *crête*, Sp., Port., It. *cresta*, crest, from Lat. *crista*, comb, tuft; connected with Lat. *crinis*, hair). Though popularly regarded as the most important feature in heraldic emblems, the crest, in the eyes of heralds, is an external adjunct to the shield, without which the bearing is complete, and which may consequently be altered without materially affecting its significance. Occupying the highest place on the helmet, it is the member of the bearing by which the knight was commonly known in battle; and from this circumstance it is to the crest that the term *cognizance* (from *cognosco*, to know) is properly given. Its claim to a classical origin is probably better than that of any other portion of coat armor. The helmet, as we see it represented on ancient statues and gems, was frequently adorned with a crest. Sometimes it was of horse-hair; at other times a lion or other animal was placed on the helmet, either erect or couchant.

The first crest to be met with in the monuments of English chivalry is that on the great seal of Richard Cœur de Lion. They came into general use about the time of Henry III., and were used as marks of distinction by commanders in the holy wars, as they had formerly been by the Roman centurions. For lightness they were often made of stuffed leather, which was gilt, silvered over, or painted—a circumstance which explains their greater size than in later times, when they were made either of wood or metal. The earliest example of the wreath on which the crest is now invariably placed is that on the monument of Sir John Harsieck. It consisted of two pieces of silk, of the colors of the armorial bearings of the wearer, twisted together by the lady who had chosen him for her knight.

It is now represented as consisting of two stripes of gold or silver lace, twisted into a circular cord. Its tinctures are always those of the principal metal and color of the arms. It is a rule in delineating the wreath, which is shown edgewise above the shield, that the first coil shall be of metal, and the second of color. Civic, triumphal, and other crowns were used as wreaths; and this practice is supposed to have given rise to the use of coronets, out of which crests are sometimes represented as issuing, even in the case of persons who are not noble.

Consult: Fairbairn, *Book of Crests of the Families of Great Britain and Ireland* (Edinburgh, 1892); and for foreign crests, see Reitstap, *Armorial général* (Gouda, 1884-87). See, also, **HERALDRY** and the authorities referred to there.

CREST, or **CRESTING**. In architecture, an ornamental finishing in stone, tiles, or metal, running along the top of a wall, or the ridge of a roof, or surmounting a gable or pinnacle. *Crest-tiles*, or, as they are corruptly called, *crest-tiles*, or *crease-tiles*, are frequently in the form either of small battlements or Tudor flowers. See **COPING**.

CRESTED. A term in heraldry. When a cock or other bird has its comb of a different tincture from its body, it is said to be crested of such a tincture, naming the tincture.

CRESTED DOG'S-TAIL GRASS. See **DOG'S-TAIL GRASS**.

CRESTON. A city and county-seat of Union County, Iowa, 70 miles southwest of Des Moines; on the Chicago, Burlington and Quincy Railroad (Map: Iowa, C 3). It has extensive machine-shops, car-works, wagon-factories, etc. Creston was settled in 1868 and incorporated the following year. It is governed at present under a charter of 1870, revised in 1890, which provides for a mayor, chosen biennially, and a city council, elected by wards. Population, in 1890, 7200; in 1900, 7752.

CRESWICK, **THOMAS** (1811-69). An English landscape painter, born in Sheffield, February 5, 1811. He was a pupil of J. V. Barber in Birmingham, and went to London in 1828. He constantly exhibited at the British Institution and the Royal Academy. In 1842 the British Institution awarded him a premium of eighty guineas, and in the same year he was made an associate of the Royal Academy. He was made R.A. in 1851. He died at Bayswater, December 28, 1869. He was a landscape painter of popular subjects, such as rippling streams, riverside nooks, glens, and dells. He was a fair technician and a good colorist. Among his principal paintings are: "Welsh Glen" (1843); "London Road a Hundred Years Ago" (1847); and the "Weald of Kent." He was also an etcher of repute, and contributed many etchings to the publications of the Etching Club.

CRETACEOUS (krê-tā'shūs) **SYSTEM**, or **CHALK FORMATION** (Lat. *cretaceus*, chalky, from *creta*, chalk). A term applied to a series of strata underlying the Tertiary and resting on the Jura-Trias, the name being derived from the chalk-beds which form such a prominent member of the Cretaceous in England and France, although such chalk-beds are rare in the United States, occurring only in Texas and Arkansas. There exists at

times an unconformity between the Upper Cretaceous and the Eocene, or lower member of the Tertiary, especially in the United States. The classification of the Cretaceous presents many difficulties, owing to the variable section which it exhibits in different areas; but European and American geologists are agreed on a division into an upper and a lower member, while for divisions of lesser size local names are employed.

The Lower Cretaceous is represented in the northern Gulf States by (a) Tuscaloosa and (b) Eutaw stages; in Texas and the western Gulf borders by (a) Trinity, (b) Fredericksburg, and (c) Washita stages. The Upper Cretaceous in the Rocky Mountain region has the following subdivisions: (a) Dakota stage, (b) Benton stage, (c) Niobrara stage, (d) Pierre stage, (e) Fox Hills stage, (f) Laramie stage; while in the Atlantic border States it is divided into (a) Raritan stage and (b) New Jersey Greensand stage. The Cretaceous rocks of North America form a belt of increasing width, extending southward along the Atlantic coast from New York, through New Jersey, Maryland, North Carolina, Georgia, and Florida; then around the northern and western shores of the Mexican Gulf, up the Mississippi Valley to the mouth of the Ohio, and from Texas northward to the foothills of the Rocky Mountains. They occur also in Nebraska, Kansas, and Iowa. The greatest development of the Cretaceous system is in Wyoming, Utah, Colorado, and west of the Sierra Nevadas in California. In some portions of these last-named regions it is found at heights of 10,000 and 12,000 feet. It occurs also in Arctic America, near the mouth of the Mackenzie River. The American Cretaceous beds consist of greensand—called also 'marl,' and much used in New Jersey and elsewhere for fertilizing land—sands of other kinds, clays, shell deposits, and, on the Gulf of Mexico, especially in Texas, limestone. In New Jersey the formation is 400 or 500 feet thick; in Alabama, 2000 feet; in Texas, 800 feet, chiefly solid limestone; in the upper Missouri basin more than 2000 feet; and east of the Wasatch, more than 9000 feet.

The rocks of the Cretaceous contain an abundance of both animal and plant remains, for this was a closing period of an era in which reptiles predominated, and, curiously enough, but few or none of the Cretaceous species have continued into the Tertiary. The plants found in the Cretaceous represent angiosperms, which were not found before this era, both dicotyledons and palms, the former including species of the oak, willow, poplar, beech, maple, fig, tulip, sassafras, eucalyptus, and sequoia. Many palms and cycads are found in the Cretaceous of North America. The appearance of the dicotyledons in this formation is rather sudden. The animal remains found include both the smallest and largest forms. There are foraminifera, sponges (which were very common in the chalk), echinoids, many mollusks, especially spirally coiled ammonites, and oysters. The fishes show a continuation of the placoids and ganoids of the former era; but teleosts, or true bony fishes, made their first appearance. There was also an extraordinary abundance of reptiles, including enaliosaurs, dinosaurs, pterosaurs, and crocodiles. Some of the pterosaurs from the Kansas rock measured from 20 to 25 feet in expanse of wing. The sea-saurians were from 10 to 50 feet

long. Cope describes the elasmosaurus as a snake-like form 40 feet long, with an arrow-shaped head on a swan-like neck that rose 20 feet out of the water. Consequently it could swim many feet below the surface, and yet have its head extended into the air for breath. The American rocks supply 40 species of sea-serpents. More curious still were the birds with teeth, found in New Jersey and Kansas. (See *Ichthyorhynchus*.) The mammalian remains were mostly those of lower orders, such as marsupials and monotremes.

The geographic developments in North America during the Cretaceous were great. The interior continental sea was shallowed, and finally obliterated by the uplifting of the land, so that the eastern and western portion of the United States were joined into one continent. This uplift became emphasized toward the end of the Cretaceous, when the Rocky Mountains were formed. Violent volcanic eruptions accompanied this uplift, and the lava-flows of the Yellowstone regions date from this time.

The economic products include most of the coal and lignite deposits of the Western States. Many of the gold and silver bearing fissure veins of the Rockies were formed in the Cretaceous, while other products are fire-clays, chalk, greensand, and iron ores.

In Europe the Cretaceous rocks assume great importance. According to Geikie, they may be grouped into two fairly distinct areas, of which the northern includes Great Britain, the lowlands of central Europe, with portions of Silesia, Bohemia, and northern France; while the southern embraces the central and southern part of France, the Alps, and the Mediterranean basin. The northern area is characterized by shallow-water deposits—sandstones, conglomerates, and marls—more or less glauconitic, and passing into a loosely textured limestone or chalk. In the southern basin the typical rocks are massive, compact limestones, which indicate conditions of deeper water and freer communication with the open sea. The entire series of rocks is usually grouped by geologists as follows: Lower Cretaceous—(a) Neocomian, (b) Urgonian, (c) Aptian; Upper Cretaceous—(a) Gault or Albian, (b) Cenomanian, (c) Turonian, (d) Senonian, (e) Danian. The dividing line between the Upper and Lower Cretaceous is regarded by the French geologists as occurring at the top of the Albian. The most conspicuous member of the Cretaceous is the white chalk (Upper Cretaceous) which forms the remarkable cliffs of southeastern England and northwestern France.

Consult Dana, *Manual of Geology* (4th ed., New York, 1896); Geikie, *Text-Book of Geology* (London, 1893); White, "Correlation Papers, Cretaceous," *United States Geological Survey, Bulletin* 82 (Washington, 1891).

CRETE (Lat. *Creta*, Gk. *Κρήνη*, *Krētē*, NGk. *Κρήνη*, *Kriti*, Turk. *Kiriti*), or **CANDIA**. An island in the Mediterranean, situated south of Greece, considered the most southerly part of Europe. It lies between latitudes 34° 57' and 35° 41' N., and between longitudes 23° 30' and 26° 20' E. (Map: Greece, F 6). It is oblong in shape, having a length of about 150 miles, and varying from 6 to 35 miles in width, with an area of 3326 square miles. Its mountainous surface bears some resemblance to that of Greece. The western part of the island is the more elevated, and con-

tains the large mountain range of the White, or Madaras, Mountains, which rise to a height of over 8000 feet. The central mountain of Ida, or Psiloriti, reaches about the same altitude. The eastern part is lower, but there are several peaks between 5000 and 7000 feet high. The northern coast is well indented, and abounds in good harbors, that of the Bay of Suda on the northwest coast being one of the best in the Levant. The southern coast is mainly unbroken and inaccessible. There are several rivers, but they run dry during the summer season. There are numerous springs throughout the island. The climate of Crete is one of the most salubrious in Europe. In spite of its mountainous surface, Crete has a soil of remarkable fertility, producing most of the southern fruits and grains. The thick forests which formerly covered the mountains have entirely disappeared, but there are still found some trees, such as the cypress, the chestnut, and the olive, cultivated mostly in the lowlands.

The chief products are olive oil, grapes, oranges, lemons, and other southern fruits. The vine of Crete, which enjoyed such fame in the Middle Ages, has greatly deteriorated. One of the chief manufactured products exported is soap, which is made of olive oil. The commerce of Crete is chiefly with Greece and Turkey, to which it exports olive oil, chestnuts, and silk. The total value of the trade of Crete for 1899-1900 amounted to about \$3,300,000, of which about two-thirds represented imports. The principal ports are Khania, Retimo, and Candia. The Bank of Crete was founded in 1899, with a capital of \$1,930,000, and obtained the privilege of issuing notes for thirty years.

Crete is an autonomous State under the suzerainty of Turkey. In accordance with the Constitution of 1899, the executive authority is vested in a High Commissioner, a post now occupied by Prince George of Greece, who is assisted by a council of three nominated members, who also hold portfolios and sit in the Assembly, but have no votes. The Assembly consists of Deputies elected for two years at the rate of one for every 5000 inhabitants, and ten Deputies nominated by the High Commissioner. The foreign affairs of Crete are under the control of the representatives at Rome of the four Powers which are responsible for its autonomy—Russia, Great Britain, France, and Italy. The revenue is derived chiefly from direct and indirect taxes. For 1900-01 the budget balanced at nearly \$1,200,000. The public debt amounted in 1900 to nearly \$460,000. According to a decision rendered by the four Powers in August, 1901, the island is to pay the sum of about \$290,000 and concede the salt monopoly to the Ottoman Public Debt for twenty years, in return for the relinquishment on the part of Turkey of all privileges in Crete. For administrative purposes Crete is divided into five departments, which are subdivided into sub-prefectures and parishes. There is no standing army, but militia service is obligatory on all male Cretans. Education is compulsory between the ages of six and nine, and the 326 educational institutions of the island had in 1900-01 an attendance of over 36,000.

The population of Crete, according to the census of 1900, numbered 301,273, consisting of 267,266 Greeks, 33,281 Mussulmans, and 726 Jews. As compared with the figures of 1881, the

total population shows an increase of nearly 23,000, while the Mussulman element has decreased by nearly 40,000. The foreign population, which is not included in the above figures, numbered in 1900 over 6000. Greek is spoken by the inhabitants of the island. The capital is Canca (q.v.).

HISTORY. Of the aboriginal inhabitants of Crete little is known apart from legend; but recent archaeological discoveries tend to show that the island was settled at a very early period by Phœnicians and Egyptians, and that it undoubtedly was a stepping-stone for those who brought the culture of the valley of the Nile to the mainland of Greece.

Passing by the possible identification of Crete with the Old Testament Caphtor, and with the Kefto of the Egyptian inscriptions, one of the earliest historical notices of the island is that embodied in the *Odyssey* (xix. 172-79). Here it is spoken of as well populated, and by people of mixed descent, pure Cretans, Achæans, Dorians, and others. The main element in the population was Greek, but whether Dorian or some other type is uncertain. Here the fabled King Minos, son and companion of Zeus, reigned in legendary days. When the *Odyssey* was composed, Cnosus, Minos's capital, situated in the northern part, was the greatest of the ninety cities of Crete. By the side of Cnosus, the city republics of Gortyna, in the south, and Cydonia, in the northwest, rose to great prominence.

As allies of the Cilician pirates the inhabitants came into conflict with Rome, and, after a desperate resistance of two years, were subdued by Metellus in B.C. 66. On the division of the Empire the island fell to the Byzantine rulers, who held it till the year 823, when it was conquered by an army of Arabs from Andalusia. In 963 the Byzantines drove out the Saracens and reestablished Christianity in the country. Upon the establishment of the Latin Empire of the East, in 1204, Crete was given to Boniface of Montferrat, who sold it to the Venetians. These retained their power till 1669, when the Turks, after a blockade lasting twenty-one years, took the fortress of Candia. The last vestiges of Venetian authority disappeared in 1715, and Crete remained a part of the Ottoman Empire.

Widespread discontent with Turkish rule, and the hostility prevailing between the Christian and the Mussulman inhabitants, led to repeated revolts and civil wars in the latter half of the nineteenth century. An insurrection lasting from 1866 to 1868 extorted from the Porte the promise of reforms in the Government; the pledge remained unredeemed, however, till 1878, when the Sultan, spurred on by the Congress of Berlin, issued a pact or charter, and appointed a Christian Governor-General of the island; but the rights promised in the charter were not accorded, and the influence of the Christian *râli* was offset by the appointment of a Mussulman Military Governor, in whom the real power was vested. In 1889 the Christians rose in arms, but the revolt was suppressed, the pact was abrogated, and the island held under military rule till 1894, when the intervention of the Powers led to the reappointment of a Christian Governor. It was a repetition of the old farce.

In 1896 a fresh uprising took place. The Sultan gave his consent to the calling of a national assembly, but the Christian insurgents refused to

lay down their arms, in expectation of assistance from Greece, where their efforts for independence were watched with great sympathy. In February, 1897, a Greek force landed in Crete and attacked the Turkish troops. But Greece, which had counted on European sympathy, if not active aid, in its struggle with Turkey, found itself alone. The concert of Powers, comprising Austria, England, France, Germany, Italy, and Russia, declared that Crete should be granted complete autonomy, but that annexation to Greece was impossible; they established a peaceful blockade of the island, and demanded that Greece recall its troops. The refusal of Greece to comply plunged it into war with Turkey, the outcome of which destroyed all hopes of annexation. From 1897 to near the end of 1898 Crete was the scene of continuous violence, while the Powers quarreled over the appointment of a Governor. At length, the Ottoman forces were withdrawn from the island, and in December, 1898, Prince George of Greece, son of King George, was created High Commissioner of Crete for the Powers, for a term of three years. A national assembly met and formed a constitution providing for the creation of a legislature, and guaranteeing freedom of religion to all inhabitants. With life and property thus secured, the people returned to their wonted occupations and order was quickly restored. Consult: Hoeck, *Kreta* (Göttingen, 1823-29); the *Opus Magnum* of Cretan topography, mythology, and archæology; Raulin, *Description physique de l'île Crète* (Paris, 1869); Bursian, *Geographie von Griechenland*, vol. ii. (Leipzig, 1869-72); Pashley, *Travels in Crete* (Cambridge, 1837); Spratt, *Travels and Researches in Crete* (London, 1865); Stillman, *The Cretan Insurrection of 1866-68* (New York, 1874); Mitchell, *The Greek, the Cretan, and the Turk* (London, 1897); *Annual of the British School at Athens*, vol. vi., vii. (Athens, 1899-1901). For further information about discoveries, see ARCHEOLOGY; CNOSSUS.

CRETE. A city in Saline County, Neb., 20 miles southwest of Lincoln; on the Chicago, Burlington and Quincy and the Missouri Pacific railroads (Map: Nebraska, H 3). The principal industries comprise flour-mills, a creamery, and nurseries. The city contains a public library and is the seat of Doane College (Congregational), established in 1872, which has a well-equipped observatory. Settled in 1867, Crete was incorporated as a village in 1871, and is at present governed under a revised charter of 1886. The council is made up of the mayor, elected annually, and representatives from the city wards. The city owns and operates its water-works and electric-light plant. Population, in 1890, 2310; in 1900, 2199.

CRETIN, krâ-tân', JOSEPH (1800-57). An American ecclesiastic, first Roman Catholic Bishop of Saint Paul, Minn. He was born in Lyons, France, pursued ecclesiastical studies in that diocese, was ordained priest, and in 1838 volunteered to assist Bishop Loras, of Dubuque, Iowa, as a worker in the American missions. Vicar-General of Dubuque until 1851, and pastor of the cathedral church of Saint Raphael for much of the time, he in that year received episcopal consecration as pioneer bishop of Saint Paul, and entered upon his work with a clergy of nine. He soon established a school, a seminary, a

hospital, and an asylum; restored the mission among the Winnebagoes at Long Prairie, and founded new missions among the Ojibways. In three years he had increased the number of churches from one to twenty-nine, and to these had added thirty-five stations. He also began the building of the Cathedral of Saint Paul. Consult Clarke, *Lives of the Deceased Bishops*, vol. ii., pp. 415-500 (New York, 1872).

CRÉTINEAU-JOLY, krâ'tê'nô' zhâ'lé', JACQUES (1803-75). A French author. He was born at Fontenay-le-Comte, Vendée. His first publications were verses, of which *Les chants romains* (1826) are the best known. He then wrote for the newspapers, and made special historical studies, particularly of the war of the Vendée. His principal work is *L'Histoire religieuse, politique et littéraire de la Compagnie de Jésus* (1844-46). This may be called the official history of the Order, and is written from unedited and authentic documents.

CRE'TINISM (Fr. *crétinisme*, from *crétin*, idiot; possibly from OF. *christien*, *christien*, Fr. *chrétien*, Christian, as being one of simple mind). A term applied, in a general sense, to idiocy, or defective mental development, depending upon local causes and associated with bodily deformity or arrested growth. Cretinism is very often found in connection with goitre (q.v.), in the lower Alpine valleys, not only of Switzerland and Italy, but of the Pyrenees, Syria, India, and China. In Europe it is rarely met with at a higher elevation than 3000 feet, and haunts chiefly the valleys surrounded by high and steep walls of rock, which exclude the light and limit the free circulation of air. Cretins are either imbeciles with intelligence or idiots; their bodies are dwarfed, with curvature of the spine forward, pendulous belly, distorted legs, small, deep-set eyes, large mouth, with protruding lower lip, sparse harsh hair, dry skin, and irregularly large or small skull.

Cretinism was thought to be due to lime in the drinking-water of the districts in which these people live, but has been proved to be dependent upon disease of the thyroid gland. Treatment of adult cretins with thyroid gland, administered by the mouth, or by implanting thyroid glands from animals in the patients' bodies, has resulted in great improvement. Treatment of infant cretins with doses of the gland has resulted in a cure; but the thyroid must be taken as food for life, otherwise the patient relapses into an imbecile and the physical changes return. See GOITRE; THYROID.

CRETONNE, krê-tôn' (so named after its manufacturer). Originally a white cloth of French manufacture. The name is now applied to a printed cotton fabric introduced about 1860 and used for curtains or for covering furniture. Chintz (q.v.), so much employed for the same purpose in former years, is a comparatively thin printed cloth highly glazed. Cretonne, however, is generally thick and strong, and with a twilled, crape, basket, wave, or other figure produced on the loom. When a pattern is printed on this uneven surface, it has a rich, soft appearance. A cretonne is rarely calendered or glazed. The thick weft threads of inferior qualities are commonly formed of waste cotton, and the patterns upon these, though often bright and showy, are as a rule printed in more or less fugitive colors.

Some cretonnes are now printed on both sides with different patterns.

CREÛSA, krê-û'sà (Lat., from Gk. Κρέουσα, *Kreousa*). (1) The wife of Jason, and daughter of King Creon of Corinth. She was burned to death with her father by the magical poisoned diadem and robe given to her as bridal gifts by Medea. (2) The daughter of Priam and Hecuba, and wife of Æneas. She disappeared during the flight from Troy, and when Æneas returned to the burning city to search for her she reappeared, announcing her adoption as a nymph by Cybele, and prophesying his coming good fortune in Italy.

CREUSE, krêz (Fr., hollow). A central department of France watered by the river from which it derives its name (Map: France, H 5). Area, 2150 square miles. Population, in 1896, 258,900; in 1901, 277,831. Low mountains and chains of hills, intersected by winding valleys, deep and narrow, occupy the greater part of the land. The streams, with the exception of the Creuse, are insignificant. The climate is moist and variable, and the soil poor. The products are rye, buckwheat, oats, and potatoes; but the rearing of cattle forms the chief branch of rural industry. Large quantities of chestnuts and fruit are grown. Coal is mined at Ahun and Bourgneuf, while iron, lead, tin, and antimony are found at various points. The people of Creuse use a coarse patois; they are generally industrious, and annually migrate in large numbers to find work in various parts of France. Capital, Guéret.

CREUSE. A river of France, rising in the mountains on the southern border of the Department of Creuse, flowing in a generally north-northwest direction through that department, then in a northerly and westerly direction through Indre, then on the borders of the departments of Vienne and Indre-et-Loire, and falling into the Vienne, a tributary of the Loire, about 12 miles north of Châtellerault, after a course of 150 miles.

CREUSOT, krê'zò', LE. A town in the Department of Saône-et-Loire, France, 12 miles southeast of Autun (Map: France, L 5). It is situated in the midst of a district rich in coal and iron, and is noted as the seat of Schneider's immense works, comprising coal-mines, iron-foundries, and extensive factories for the production of heavy cannon and other ordnance, locomotives, stationary engines, etc. These works employ 16,000 persons. Le Creusot also has glass manufactures. A statue of Eugène Schneider (1805-75), by Chapu, is a feature in the town. From a small hamlet, known as Charbonnière, Creusot rose to its present importance after the establishment of iron-works in 1770, and their development from 1837 by Messrs. Schneider. The population, which in 1841 was 4000, reached 32,034 in 1896; but by 1901 it had decreased to 30,584.

CREUTZ, kroits, GUSTAF PHILIP, Count (1731-85). A Swedish politician and poet, born in Finland. In 1763 he was sent as Minister to Madrid, and in 1766 as Minister to Paris, where in 1783 he concluded with Benjamin Franklin a commercial treaty between Sweden and the United States. He was subsequently chancellor of the University of Upsala. He is chiefly known for the idyl *Atis och Camilla* (*Atys and Camilla*,

1761), which, with ten other poems, appeared in a volume edited by Gyllenberg (1795). A new edition of his poems was published in 1862.

CREUZER, kroits'sër. GEORGE FRIEDRICH (1771-1858). A German philologist. He was born at Marburg, and studied there and at Jena. In 1802 he was appointed a professor at Marburg, and in 1804 obtained the chair of philology and ancient history at Heidelberg, which he occupied for forty-four years with great credit. In 1848 he retired to private life. He died at Heidelberg, February 15, 1858.

Creuzer's whole life was devoted to the study of antiquity. His first, and probably his greatest work, was *Symbolik und Mythologie der alten Völker, besonders der Griechen* (1810-12). This treatise, which asserted the symbolical character of ancient mythologies, excited a lively controversy, in which Hermann and Voss appeared as the opponents of Creuzer. His next work in importance was a complete edition of the works of Plotinus (3 vols., Oxford, 1835). Along with G. H. Moser, Creuzer edited several works of Cicero—*De Natura Deorum* (1818); *De Legibus* (1824); *De Re Publica* (1826); and *De Divinatione* (1828). Between 1837 and 1848 he published a partial collection of his writings in ten volumes (*Deutsche Schriften*, Leipzig and Darmstadt), the last of which contains an autobiography of Creuzer under the title *Aus dem Leben eines alten Professors*. He was also a prolific writer of essays on archaeological topics. In 1854 appeared *Friderici Creuzeri Opuscula Selecta*.

CREUZNACH, kroits'näg. See KREUZNACH.

CREVAL'LE (from Sp. *caballa*, horse-mackerel, from *caballo*, horse, from Lat. *caballus*, horse), or CAVALLY. A name in Florida and the West Indies for various edible mackerel-like sea-fish of the genus *Caranx* (family Carangidæ), especially the large horse-erevalle or jaek (*Caranx hippos*), which is found on both coasts of the warm parts of America, and also in the East Indies. It is olivaceous above; sides and below golden; opercle marked with a large black blotch; canines of the lower jaw very prominent. It frequently exceeds fifteen pounds in weight, and is common in Florida, where it is regarded as a fine food-fish. A closely related species (*Caranx caballus*) of the Pacific Coast of Mexico is called 'cocinero' or 'cocinero dorado.' See JUREL; Plate of HORSE-MACKERELS, ETC.

CREVASSE, krâ-vâs'. See GLACIER.

CREVAUX, krâ'vò', JULES NICOLAS (1847-82). A French explorer, born at Lorquin, Lorraine. He made four extensive tours through South America. On the first of these (1877) he visited the interior of Guiana and crossed to the Tumuchumae mountains, the first European to perform that feat. In the following year he visited the valley of the Rio Oyapok, and after exploring the Amazon region, returned to Paris. On his next tour, undertaken for the purpose of exploring the left affluents of the Orinoco, he traveled from Bogotá, along the upper Rio Negro to the Rio Guaviare, which he reached October 20, 1880. In 1882 he journeyed through the valley of the Parana, explored the Tapajos and several other rivers, and discovered numerous remains of Inca civilization. While endeavoring to ascend the Pileomayo, in order to visit certain Indian tribes, he was attacked by the Tobas and killed with nineteen of his companions; two Bolivians

of his escort alone escaped to relate the details of the catastrophe. An account of his explorations has since appeared under the title, *Voyages dans l'Amérique du Sud* (1883). A work published by the Geographical Society of Paris, and entitled *Fleures de l'Amérique du Sud* (1883), is also based upon his researches.

CRÈVECŒUR, krëv'kêr', JEAN HECTOR SAINT JOHN DE (1731-1813). A French agriculturist, traveler, and author. He was born at Caen, and was educated in England. He came to America in 1754, bought an estate near New York, and married the daughter of an American merchant. He suffered much from the Revolutionary War, and in 1780 was imprisoned three months in New York on suspicion of being a spy. He was sent to England as a prisoner, was exchanged, reached France in 1782, and introduced there the culture of the American potato. On his return to New York (November, 1783) as French Consul, he found his wife dead, his house burned; his children, too, had disappeared, but were finally found in the care of a kindly merchant. He had previously published *Letters of an American Farmer* (1782), which he translated into French and published in Paris. They gave such glowing accounts of the climate and fertility of America that five hundred families are said to have left France for the Ohio Valley on the strength of his statements. Most of them soon died there. He wrote also a volume on *Potato Culture* (in French), and *A Journey in Upper Pennsylvania and in New York State* (2 vols., in French, 1801). In his most important work, the *Letters*, Crèveœur, disguising his French nationality, writes as a simple-hearted American farmer of slight education and narrow horizon. Internal evidence in his writings tends to indicate that he was a Quaker. He was a man of much cultivation, who refused to take any part in the fierce political and military controversies of the Revolution. His idyllic descriptions of life in the New World, with its approximation to Rousseau's state of nature, transformed crudity into an idealistic mirage that fascinated the philosopher. Yet in some ways Crèveœur's ideals were such as typical Americans have rarely been without—he saw in prophetic vision the future glory of the country. He had an exquisite sympathy with natural life that makes some of his descriptive passages prose idyls of great beauty; for example, the beautiful passage describing him feeding quails in the snow. The *Letters* were translated into German and Dutch, and their idealized treatment of American rural life may perhaps be traced in Campbell, Southey, Coleridge, and Byron—possibly in Chateaubriand. After holding his consulship for ten years, Crèveœur returned to France, dying at Sarcelles. Consult Tyler, *Literary History of the Revolution* (New York, 1897).

CREVILLENTE, krä've-lyän'tá. A town of Spain, in the Province of Alicante, about 20 miles west-southwest of the city of that name (Map: Spain, E 3). It is picturesquely situated at the foot of the hills near the boundary of Murcia and has a pretentious town hall, and a castle, formerly the possession of the Count of Altamira. Weaving and agriculture are the principal industries. Crevillente is supposed to have been founded by the Romans. Under the Goths it formed part of the Kingdom of Todmir;

it passed into the hands of the Moors, by whom it was held until 1263. Population, in 1900, 10,865.

CREW (older form also *crue*, apocopated from *accruc*, OF. *acrecie*, *acrecue*, increment, from *accristre*, Fr. *accroître*, to increase, from Lat. *accrescere*, to increase, from *ad*, to + *erescere*, to grow). A term used to designate the body of men employed to man a ship, boat, gun, etc. The crew of a full-rigged sailing ship is divided into five parts—forecastlemen, foretopmen, maintopmen, mizzen-topmen, and afterguard; these are called the *parts of the ship*, and they are again subdivided into port and starboard *watches*, and each watch is again separated into *first* and *second parts port* (or *starboard*). Modern men-of-war without sail-power usually have the crew divided according to the arrangement of the battery. It is customary to have four deck divisions and the guns are manned by them. In addition to these there are the powder division, engineer's division, and marines.

CREW, HENRY (1859—). An American physicist, born at Richmond, Ohio. He graduated at Princeton in 1882, was fellow in physics at the Johns Hopkins University in 1884-87, and instructor in physics at Haverford College in 1888-91. In 1891-92 he was astronomer of Lick Observatory, and in 1892 was appointed professor of physics at Northwestern University (Evanston, Ill.). He also became assistant editor of the *Astrophysical Journal*, and published *Elements of Physics* (1899).

CREWE, kröö. A town of Cheshire, England, about 43 miles southeast of Liverpool (Map: England, D 3). It is a central station of several railways and owes its importance to the establishment in 1843 of the immense workshops of the London and Northwestern Railway, which now employ more than 7000 men. Crewe was incorporated in 1877. Its affairs are administered by a mayor, a municipal council of nineteen, and a board of aldermen of seven members. (See GREAT BRITAIN, paragraph on *Local Government*.) Its supply of gas and water is provided by the London and Northwestern Railway. It has a modern system of sewerage connected with a sewage farm. Two hospitals, a technical school and school of art, public baths, and a large general market are maintained by the corporation. Among its chief industries are the manufacture of locomotives, railway-cars, clothing, and fustian. In 1851 its population was only slightly over 4000, in 1874 it had reached 18,000, in 1891 it was 32,774, and in 1901, 42,075.

CREWLER. The name of an indigent clergyman's family in Dickens's *David Copperfield*. The wife has an infirmity of the legs which makes them susceptible to the least domestic trial. Traddles marries one of the daughters, after a long engagement.

CREYTON, krä'ton, PAUL. A pseudonym of J. T. Trowbridge.

CRIB. See FOUNDATIONS.

CRIBBAGE (from *crib*, rack, Ger. *Krippe*, OHG. *krippa*, also *chripfa*; connected with MHG. *krêbe*, basket, which is probably related to Lat. *corbis*, basket). A game of cards, which can be played by two, three, or four persons, but is

mostly played by two with a pack of fifty-two cards. When four persons are engaged, they take sides. The value of the cards is: face cards ten, ace one, and the rest as marked. The number of cards dealt is usually five. The points are scored on a board, and sixty-one constitutes game. The players cut for deal; the player who loses the deal takes three points, as a makeweight for the adversary's advantage. Five cards in alternate succession are then dealt, the rest of the pack being placed face downward on the table. The players gather up their five cards, inspect them and select two to place them on the table face down. These cards are called 'the crib,' and become the property of the dealer. The non-dealer then cuts the remainder of the pack and the dealer turns up the top card. The play then begins, the player announcing the value of each card as he plays it; thus suppose it is a king he calls 10—the next player says, for example, 8; then another card is played by the first player, and so on until the whole amount reaches 31, or as near it, without exceeding it, as can be accomplished. The details of counting the points made in play are too intricate to exemplify in a general description. After the play of the hand is completed, each player counts all the fifteens he can by any combination make out of the cards he holds in conjunction with the 'turn up' card. Then the dealer takes up the four cards thrown out for the 'crib' by the two players as already mentioned and counts them in the same way in conjunction with the turn up or start card. Each party is entitled, in addition to the points made in play or in crib, to count 'pairs,' 'pairs royal,' 'double pairs royal,' and for 'the knave,' as well as to count sequences—three or more cards following in successive numbers—and flushes, when all the cards in crib are of the same suit. Consult: Cady, *Cribbage* (New York, 1897); 'Aquarius,' *Piquet and Cribbage* (London, 1883).

CRIBBING, or CRIB-BITING. A bad habit met with especially in the lighter breeds of horses, and those spending a considerable amount of time in the stable. The act consists in the animal seizing with his teeth the manger, rack, or any other such object, and taking in at the same time a deep inspiration, technically called wind-sucking. Cribbing springs often from idle play; may be first indulged in during grooming, especially if the operation is conducted in the stall, and the animal be needlessly teased or tickled; is occasionally learned, apparently, by imitation from a neighbor; and in the first instance is frequently a symptom of some form of indigestion. Its indulgence may be suspected where the anterior edge of the front teeth is worn off, and will soon be proved by turning the animal loose where he can find suitable objects to lay hold of. It usually interferes with thriving and condition, and leads to attacks of indigestion. It can be prevented only by the use of a muzzle or throat-strap; but in those newly acquired cases resulting from gastric derangement, means must further be taken to remove the acidity or other disorder.

CRICHTON, kri'ton, JAMES (1560-c.85), called THE ADMIRABLE CRICHTON. A Scotchman famous for his versatility and his universal accomplishments. He was the son of Robert Crichton, of Elioek, Dumfriesshire, who was joint

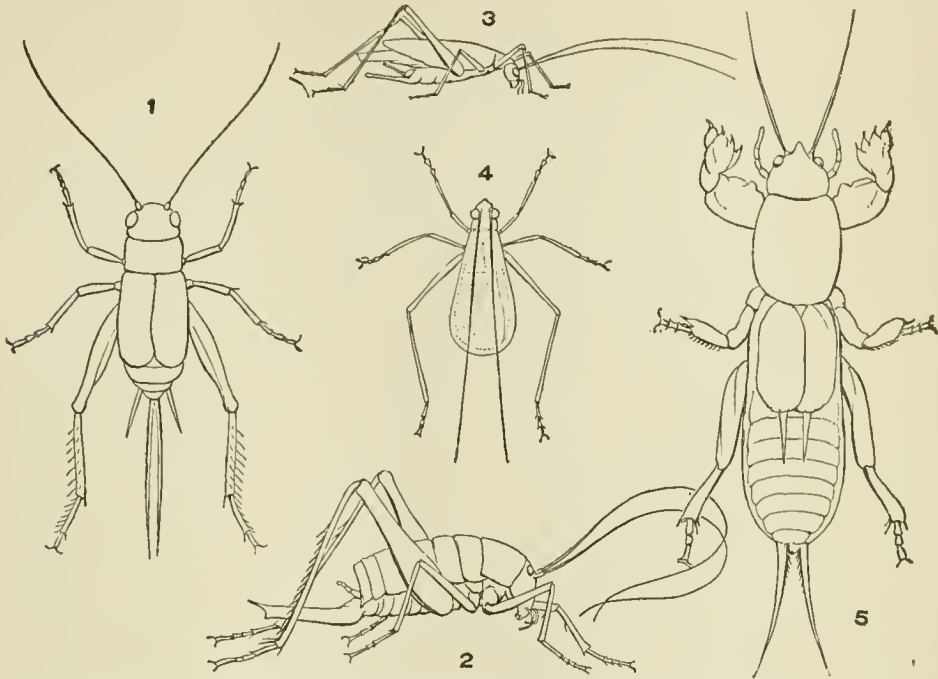
Lord Advocate of Scotland from 1562 to 1573, and from 1573 to 1581. On his mother's side he claimed descent from the old Scottish kings. He was educated at Saint Andrews University. Before he reached his twentieth year he had, it seems, "run through the whole circle of the sciences," mastered ten different languages, and perfected himself in every knightly accomplishment. In Paris, Rome, Venice, Padua, and Mantua, he achieved the most extraordinary victories in disputation on all branches of human knowledge, and excited universal amazement and applause. The beauty of his person and the elegance of his manners also made him a great favorite; while, as if to leave no excellence unattained, he vanquished a famous swordsman in a duel at Mantua (1582). The Duke of Mantua appointed him preceptor to his son, Vincenzo di Gonzaga, a dissolute and profligate youth. One night, between 1585 and 1591, during a carnival, Crichton was attacked in the streets of Mantua by six masked men. He pushed them so hard that their leader pulled off his mask, and disclosed the features of Vincenzo. With an excess of loyalty, Crichton threw himself upon his knees and begged the young prince's pardon, at the same time presenting him with his sword, which the heartless youth plunged into the body of his tutor. What degree of truth there may be in the eulogies of his biographers it is impossible to determine, but he is known to have associated himself with the Venetian publisher Aldus Mamtius, who is the authority for many otherwise unauthenticated biographical details. W. H. Ainsworth wrote a romance founded on the story of Crichton in 1837. Consult Tytler, *The Life of James Crichton* (London, 1819; revised ed. 1823).

CRICKET (OF. *crequet*, Fr. *criquet*; ultimately imitative in origin). Any of the saltatorial insects of the orthopterous family Gryllidæ, distinguished from the Locustidæ by the cylindrical spear-shaped ovipositor of the female. The family contains three very distinct groups: (1) Mole-crickets (q.v.), with fore legs developed for burrowing; (2) tree-crickets (q.v.); (3) true crickets, including the common field and house crickets. Most of them in all parts of the world are black or of some dull color, and are mainly nocturnal. They are herbivorous, and the American black field-crickets are most abundant in neglected fields, or where layers of old straw, etc., give them warmth and hiding. They dig holes in the ground and sit there during the day, chirping, as if with contented enjoyment, and going abroad at night; but any disturbance near them will produce instant quiet. Their eggs are laid in the loose soil, chiefly in the autumn, and hatch in the spring, few adults surviving the winters of cold climates. The commonest species in the northeastern United States (*Gryllus neglectus*) occasionally comes into houses; but the house-cricket proper is a European one (*Gryllus domesticus*) which habitually domesticates itself, and is especially fond of the crevices about old-fashioned fireplaces, where its merry chirping has woven itself into the romance and poetry of all Western nations, as a sound suggestive of domestic cheer. This species is now acclimatized in Canada and some of the Northeastern States. The wingless crickets are represented in the United States by a species

(*Ceuthophilus maculatus*) common in New England.

The chirping of these insects, which begins in midsummer, is produced by rubbing a file-like ridge of one wing over a scraping surface of the other. Only the males have these organs, and it

Indies, it has become popular with the natives. In America, it is played in certain portions of the United States and in the larger cities of Canada. The rules which govern the game all over the world are those made by the Marylebone Cricket Club of London, and from time to time



REPRESENTATIVE CRICKETS.

1. Common black cricket (*Gryllus neglectus*). 2. A wingless cricket (*Ceuthophilus maculatus*). 3. A tree-cricket, the small green or 'snowy' cricket (*Ecanthus niveus*), female. 4. Same; male. 5. A mole cricket (*Gryllotalpa borealis*).

is generally agreed that the sounds serve either to call or excite the mute females. A certain Sicilian species is said to make a noise audible a mile away. The apparatus and the musical characteristics of the sound have been exhaustively studied by S. H. Scudder, who says that the notes of the black field-cricket are pitched at E natural, two octaves above middle C. The songs of other sorts of crickets vary from this, each in its own way. To this same group belong some curious forms of the tropics in which "the front of the head is produced into a leaf-like projection." Another group are of very diminutive size, and resemble minute roaches; one genus (*Myrmecophila*) dwells altogether in the nests of ants, both in Europe and in America, our representative being *Myrmecophila pergandi*. Other species are among the insects inhabiting caves. Consult: Howard and Marlatt, "Principal Household Insects of the United States," in *United States Department of Agriculture, Division of Entomology, Bulletin 4, new series* (Washington, 1896). See CAVE ANIMALS and SYMBIOSIS, and compare LOCUST; KATYDID; MOLE-CRICKET; and TREE-CRICKET.

CRICKET (probably from OF. *criquet*, stick used as a marker in the game of bowls). The national game of England is played wherever Englishmen have colonized, and in many of Great Britain's possessions, notably in the West

are regulated at meetings of this club. This has always been the custom since the club was founded, about the year 1744. Philadelphia, which is the home of cricket in America, has more clubs than any other place in the United States or Canada, and the four larger clubs, Germantown, Belmont, Merion, and Philadelphia, compete annually for the Halifax Cup. Two other cups are also competed for by some fifteen minor clubs and second elevens from the principal clubs. Cricket in Philadelphia is controlled by the Associated Cricket Clubs of Philadelphia, in an organization composed of three delegates from each of the four large clubs. This organization publishes a periodical, the *American Cricketer*, founded in 1877. The Metropolitan District Cricket League regulates the matches within twenty miles of the City Hall in New York, and there is also a New York Cricket Association, which has assumed more importance of late years. The other organizations in the United States are the California Cricket Association, the Northwestern Cricket Association, with headquarters in Chicago, and the Massachusetts Cricket Association. International matches are played annually between the United States and Canada, and on three occasions teams from Philadelphia have visited England, while in 1900 a team was sent from Haverford College to play a series of matches against English colleges and

schools. Almost annually, in recent years, either an English, Australian, or Irish eleven has visited Philadelphia, New York, and Toronto. The Intercollegiate Cricket League is composed of teams representing the University of Pennsylvania, Harvard, and Haverford.

The game is played between two teams of eleven men each, on a level grass-field, but the exigencies of climate in Australia and the Pacific Slope of California sometimes necessitate a cement-based, matted stretch. In the centre of the field a wicket is pitched; i.e. three stumps of wood about $1\frac{1}{2}$ inches in diameter and 27 inches high are placed in a line so that with the space between them they cover eight inches; on the top of these are two light wooden bails. Twenty-two yards in a direct line from and opposite these, three similar bail-topped stumps are erected. A line from each wicket or set of stumps is drawn in white chalk, extending right and left from them about three feet. This is the bowling-crease, beyond which the bowler must not pass when delivering the ball. In front of the stumps, four feet from them, and parallel with them, another white line is drawn, called the popping-crease, within which is the batsman's domain. The bat used must not be longer than 38 inches or wider than $4\frac{1}{4}$ inches. The ball is 3 inches in diameter and weighs about $5\frac{1}{2}$ ounces. An umpire is appointed by each team, and, before starting a match, they settle what shall be considered boundaries and other conditions of play. Then the captains toss for the right to select which team shall go to the bat first. The team which so elects sends two men in, one to each wicket; the other team sends a bowler to one end and disperses the other ten men about the field in such positions as the captain's knowledge of the kind of bowler, and the kind of batter, indicates to him as likely to be most efficacious. The umpire then calls 'play,' and the bowler bowls, not throws, the ball from the end opposite the batter. If it is a ball which the batsman can reach, he either blocks it or hits it to some part of the field; if he thinks he can run to the opposite wicket and the other batsman change places with him before the ball is returned and either wicket thrown down with it, he runs; and a 'run' is scored each time the batsmen cross each other. The bowler bowls four, five, or six balls (four in a three days' match) from one end; and then the ball is handed over to a second bowler, who bowls an equal number of balls from the opposite end. The batsman may be put out in any of the following ways: if he fails to defend his wicket and the bowled ball knocks off the bails ('bowled'); if a fielder catches a batted ball before it touches the ground ('caught'); if the batsman fails to have his bat or any part of his person within the popping-crease before his wicket is thrown down with the ball ('run out'); if he steps out of his ground to play a ball, misses it, and the wicket-keeper throws his wicket down with it before he can step back ('stumped'); if when a straight ball has been bowled to him, which in the judgment of the umpire would have hit his wicket had he not prevented it by interposing any part of his body except his hand ('leg before wicket'); if in playing at the ball he knocks down his own wicket ('hit wicket'); or if he willfully obstructs the fielders. When a batsman is put out another takes his place, and the

game proceeds until the tenth man is out. Then, there being no more batsmen to come, the eleventh man's innings comes to an end, he being 'not out.' The total number of runs made off the bats, with a few penalties added which it is not necessary to detail here, make up that side's score. Then the other side goes in to bat. Each eleven has normally two innings taken alternately, the total score of each side determining the result of the match.

The bibliography of cricket is extensive. Lilly-white, *Cricketers' Annual*, and Wisden, *Cricket Almanack*, are the standard authorities on the rules for the enrent years. For general history and annals, consult: Steel and Lyttelton, *Cricket* (London, 1889); Lyttelton, *Cricket* (London, 1890); Murdoch, *Cricket* (London, 1893); Lyttelton, *Outdoor Games: Cricket and Golf* (London, 1901); Prince Ranjitsinhji, *The Jubilee Book of Cricket* (Edinburgh, 1897); Read, *Annals of Cricket* (London, 1897).

CRICKET-FROG. A small frog (*Acris gryllus*); northern specimens are variety *crepitans*) abundant throughout the warmer parts of the United States, east of the plains, and noted for its rattling cricket-like cries in spring. (See Colored Plate with TOAD.) It is about an inch long, brownish, with a blackish triangular patch (apex backward) between the eyes, the borders of which are light-colored, continued as a dorsal band to the rear end of the body; throat in spring yellow, and legs barred; but all these colors change with surroundings, as the species possesses the power of metachrosis in a high degree. "The note of this species," says Cope, "may be exactly imitated by striking two marbles together, first slowly, then faster and faster, for a succession of about twenty or thirty beats. The noise cannot be heard at a very great distance. . . . It keeps on the high grass in and around marshy places, seldom if ever ascending trees or bushes. When pursued it leaps with prodigious agility and hides under water." Their eggs are deposited in April, in little masses attached to the blades of coarse grass. A short time afterwards all the great numbers which make the marshes so noisy in April and May die off, so that until the eggs hatch and the young 'peepers' develop late in August, the species is practically extinct. Consult Abbott, "Notes on the Habits of the Savannah Cricket-Frog," in *American Naturalist* (Philadelphia, 1882).

CRICKET ON THE HEARTH, THE. A Christmas tale by Charles Dickens (1845), in which a cricket on the hearth and a tea-kettle play an important part.

CRIEFF, krē'vōn. A police burgh and health resort in Perthshire, Scotland, on the Earn, 17 miles west of Perth (Map: Scotland, E 3). It is beautifully situated at the foot of the Grampians, near the entrance to the Highlands. Its healthful climate makes it a summer resort of invalids, for whom there is provided a high-class hydropathic establishment. There are numerous handsome country seats in the vicinity. The greatest Scotch cattle market was held here till 1770, when it was removed to Falkirk. Population, in 1901, 5208.

CRILLON, krē'vōn. LOUIS DES BALBES DE BERTON DE (1541-1615). A celebrated French general, surnamed 'L'homme sans peur,' and 'Le Brave.' He was born at Murs, in Provence, and

was trained for war under François de Lorraine, Duke of Guise, then the model of military chivalry. In 1558 he gave proof of his valor at the siege of Calais, and soon afterwards at the capture of Guines. In the religious wars he fought against the Huguenots, and distinguished himself at the battles of Dreux, Jarnac, and Moncontour. He was likewise present at the battle of Lepanto, in 1571, and, though wounded, was appointed to carry the news of the victory to the Pope and the French King. He disapproved strongly of the massacre of Saint Bartholomew, but in 1573 he took part in the siege of La Rochelle. He accompanied Henry of Anjou to Poland, and after the latter's accession as Henry III. continued faithful to his sovereign in his struggle with the Catholic League. Henry IV. found in him a sincere friend and adviser, and called him 'Le Brave des Braves.' After the peace with Savoy, Crillon retired to Avignon, and, after the fashion of a true Catholic warrior, ended his days "in the exercise of piety and penance."

CRIM. CON. An abbreviation for CRIMINAL CONVERSATION, which is the technical term for adultery with another man's wife. It is no defense to an action by the husband, in such a case, that the wife freely assented to the defendant's request, for the husband does not sue for a wrong done to her, but to himself. The gist of the action is the shame which has been inflicted upon him, and the hazard, to which he is subject, of maintaining spurious issue. It is, therefore, quite distinct from the wrong of enticing the wife away from the husband, although, like seduction (q.v.), it is looked upon as a personal injury to the husband. He may condone the wife's offense, and thus lose his right to secure a divorce, without affecting his right to damages against the paramour. It has been judicially declared that the law will not hold a party remediless for an injury of this kind because, through the exercise of Christian virtue, the influence of family interest, or even in the want of what may be regarded as true manly spirit, he forgives an erring wife, and trusts in her reformation and promise of future good conduct and virtue. He may forgive the wife without forgiving the author of the defilement, and of his loss, wrong, and injury. See ADULTERY, and consult the authorities there referred to.

CRIME (OF., Fr. *crime*, It. *crimine*, from Lat. *crimen*, accusation, from *cernere*, Gk. *κρίνω*, *krinō*, to decide). *Crime* has been defined as "disobedience to a command or prohibition made with reference to a matter affecting public peace, order, or good government to which a sanction is attached by way of compensation for the injury which the act or omission may have caused to an individual."

The same act, e.g. assault and battery, may subject the actor to a criminal prosecution by the State, and to a civil action in tort by the injured individual. Such an act is at once a breach of the public peace and an invasion of the injured person's rights. In England and in each of our States certain offenses are crimes at common law, while others are made so by statute. Criminal offenses against the United States, however, are all of statutory origin. The common-law classification of crimes was into

treason (q.v.), *felony* (q.v.), and *misdemeanor* (q.v.); treason being separated from other high crimes because of its character, its mode of trial, and its punishment, and the chief distinction between a felony and a misdemeanor being that the former occasioned the forfeiture of lands and goods, while the latter did not.

CRIMINAL INTENT. In order that an act shall amount to a crime, it must be committed with a criminal intent. It is not a crime to take the life of a human being if this is done pursuant to a legal command, as in the case of a sheriff inflicting capital punishment upon a duly convicted and sentenced criminal; nor if it is the result of accident. In neither case does the person causing the other's death intend to commit a criminal act. But criminal intent is not necessarily synonymous with actual intent to become a criminal. A general criminal intent exists when the actor has an intellectual apprehension of the nature of the act which the law pronounces criminal, and voluntarily assents to its commission. In most crimes, no other intent is required. At times, however, the law requires a specific intent, as in the case of the transfer of one's property with intent to defraud his creditors, or sending poison to another with intent to injure him. Here, something more than knowingly and voluntarily disposing of the property, or sending the poison, is necessary to the commission of the crime, viz. the disposition or the sending with the specific intent to defraud or to injure. Insanity (q.v.) relieves its victim from criminal liability when it renders him incapable of forming a criminal intention. Voluntary drunkenness, even when causing temporary insanity, does not so relieve its victim, although it may be taken into account in crimes requiring a specific intent on the part of the actor, in determining whether he did the particular act with the specific intent. Infancy also relieves from criminal liability when the infant is incapable of forming a criminal intent. (See AGE.) Analogous to insanity and infancy, as an excuse for an act otherwise criminal, is coercion or duress (q.v.) when of such a character as to destroy the voluntary nature of the act. See ACCESSORY; PRINCIPAL; PUNISHMENT; also CRIMINAL LAW; CRIMINOLOGY, and the authorities there referred to.

CRIME AND PUNISHMENT. A novel by Dostoyevsky, published in 1866. It is a study of the gradually weakening intellect and final insanity of a young Russian artisan whom want has led to commit murder.

CRIMEA (Russ. *Krim*, *Krym*, Lat. *Chersonesus Taurica*). A peninsula in the south of Russia, forming part of the Government of Taurida, and comprising the districts of Perekop, Eupatoria, Simferopol, Yalta, and Feodosia (Map: Russia, D 5). It is united to the mainland by the very narrow isthmus of Perekop, between the Black Sea and the Sea of Azov, and separated from the peninsula of Taman, on the east, by the narrow Kertch Strait. The Crimea is thus almost surrounded by water—on three sides by the Black Sea and on the fourth by the Sea of Azov; while a trench 70 feet wide and 25 feet across the isthmus of Perekop cuts it off from the mainland. The Crimea is quadrilateral in shape: but a long, narrow peninsula juts out on the east which increases the extreme length of the terri-

tory from east to west to nearly 200 miles, the breadth being 110 miles. The area is about 9800 square miles. The coast is very much broken and indented, particularly on the side bordering on the Sea of Azov. The northern portion is a continuation of the southern Russian steppes, and is of argillaceous formation. Along the side facing the southeast there is a highland region, the Yaila Mountains, forming the watershed. These mountains rise to a height of over 5000 feet, their most interesting peak being the Tehtarir Dagh (Tent Mountain), the *Monts Trapezus* of the ancients. The streams rise in the southeast coast highlands, and while a few very short ones flow toward the east and southeast, most of the drainage goes into the Bay of Kalamita, the Gulf of Perekop, and the Sivash or Putrid Sea, which is a portion of the Sea of Azov almost cut off from it by the tongue-like peninsula of Arabat. The northwest section of the Crimea has but little fluvial drainage. The southern district of the peninsula rises with steep slopes from the sea, while spurs and secondary chains extend northward. These are richly wooded, but the beautiful intermediate valleys gradually sink into the uniform and desolate steppe which forms the northern and much greater part of the peninsula. The southern district of the Crimea is well cultivated, and is adorned by many country-seats of the nobles, with parks and gardens surpassed by none in Europe. The famous Imperial country-seat of Livadia is situated near the southern extremity of the peninsula. Tatar villages, mosques, and Greek convents are to be seen in most picturesque situations among the woods and rocks, with many ruins of ancient fortresses.

The southeast highland region produces a rich and varied flora. On the northern slopes and valleys grow hardy fruit and various forest trees; in the central mountain region are forests of oak, beech, elm, and other deciduous trees of central Europe; while on the higher southern slope the pine occurs, and at lower altitudes the vegetation is Mediterranean in character and the vine and the olive flourish. Grain of various kinds is produced abundantly, and silk, wax, and honey. Some small rodents, hares, and foxes are the chief mammals; reptiles and insects are not numerous. Much attention is bestowed upon horses, oxen, and sheep, in which no small part of the wealth of the country consists. The northern part of the Crimea is in every way a contrast to the southern. Apart from the general sterility of the region, the air is contaminated by exhalations from marshes, and from the Sivash. The climate of the Crimea varies considerably for such a slight extent in latitude. The northern part has cold winters and hot summers, while in the southern part the winters are warm and the heat of the summer is tempered by proximity to the sea.

The chief industry of the Crimea is agriculture. The raising of cereals is carried on mostly by the Russians and the colonists, chiefly Germans, while the Tatars and Greeks are engaged primarily in gardening. Owing to the scarcity of labor and the prevalence of large holdings, agriculture in the Crimea is based on modern lines, and the use of agricultural machinery is probably more prevalent there than in any other part of the Empire. The chief cereals raised are wheat, rye, barley, oats, and corn. The Crimea is one of

the principal tobacco-producing regions of Russia, the product being noted for its high qualities. The cultivation of fruit is extensively developed, the annual exports amounting to over \$1,000,000. Vine-growing is one of the oldest industries of the region, and the native vines are widely exported. The rearing of live-stock (which includes camels) is extensively carried on, and bee-keeping and the raising of silk-worms are among the industries. The manufacturing industries are insignificant. Large quantities of salt are obtained from the salt lakes, which are very numerous. The population, 583,893 in 1897, is remarkably heterogeneous. In the country districts the bulk of the inhabitants are Tatars; height, 1.644 meters; cephalic index, 80. They are muscular and noted as porters. Cleanliness and morality are proverbial among them. Among the other non-Russian inhabitants are Greeks, Armenians, and Germans. An interesting element in the population are the Karaite Jews. The two principal cities of the Crimea are Sebastopol, a great fortress and naval station, and Simferopol, the capital of the Government of Taurida. An interesting town is Bakhtchisarai, celebrated as the ancient capital of the Tatar Khans.

HISTORY. To the ancients Crimea was known as *Chersonesus Taurica*, from the Tauri, a mountain tribe of the south, who are supposed to have been the remnants of a Cimmerian people driven out by the Scythians in the seventh century B.C. In the sixth century B.C. the Greeks of Miletus founded flourishing colonies at Nymphæum, Theodosia, and Panticapæum (the present Kertch). About B.C. 500 these cities, together with several other towns, united to form the Kingdom of Bosphorus, which existed till the fifth century A.D., and embraced, at the period of its greatest extent, the entire peninsula and the eastern coast of the Sea of Azov. The Chersonesus stood in close commercial and social relations with the Greeks of Europe, and especially with the Athenians, who exported from the country great quantities of grain and hides, as well as many slaves. In the first century B.C. Parosades, the ruler of Bosphorus, hard pressed by the Scythians, acknowledged himself the vassal of Mithridates of Pontus, and when the latter's son, Pharnaces, was deprived of his possessions in Asia Minor by the Romans, he established himself in the Chersonesus. Under the nominal suzerainty of the Romans, and later of the Byzantines, the Kingdom of Bosphorus prospered, till about the beginning probably of the fifth century, when it fell before the Huns. The country, with the exception of the southern coastland, which was held by the Byzantines, was henceforth devastated by a succession of barbarian invasions. About the middle of the seventh century the Khazars, a fierce tribe from the region of the Volga, took possession of the peninsula and established a powerful kingdom there, chiefly remarkable for the fact that the ruler, the entire nobility, and large numbers of the people became zealous adherents of the Jewish faith. In the thirteenth century the country was conquered by the Mongols, and it constituted till about 1430 a part of the Kbanate of Kiptchak (q.v.). At the same time the Genoese founded a number of trading colonies on the southern coast, which was known as Gothia. Among these were Caffa (Kaffa), on the site of Panticapæum, which be-

came a great emporium of the commerce between Europe and Asia. After forming a part of the independent Khanate of Krim for about forty-five years, the Crimea was conquered in 1475 by the Turks, and was ruled by a Khan under the suzerainty of the Sultan. In 1571 the Khan raided Moscow and sacked the town. Russian aggressions on the Crimea began in 1735, and in the following year an army under General Münich laid the country waste. By the Treaty of Kutchuk-Kainardji, in 1774, the Porte was forced to recognize the independence of the Khan. In 1783 the country was incorporated with Russia. In 1854-56 the Crimea was the scene of conflict between the Russian armies and the allied forces of England, France, Sardinia, and Turkey. (See CRIMEAN WAR.) Consult: Telfer, *The Crimea and Transcaucasia* (London, 1872); Wood, *The Crimea in 1854 and 1894* (London, 1895); Beaulieu, *The Empire of Tsars and the Russians* (New York, 1893).

CRIMEAN WAR. The name given to the war of 1854-56 between Russia on the one hand, and Turkey with her allies, France, England, and Sardinia, on the other. It was ushered in by the struggle between Russia and Turkey, which broke out in 1853, the immediate occasion of which was the assertion by Russia of a protectorate over the Greek Christians in the Turkish dominions. Coupled with this was a dispute between Russia and France over the guardianship of the holy places in Palestine. The real ground, however, for the attitude assumed by France and Great Britain was resistance to the aggressive policy of the Russian Emperor, Nicholas I. The latter believed that the other Powers of Europe were not in a position to interfere, and saw an opportunity to continue the Russian advance which had Constantinople for its objective. Accordingly, in the spring of 1853 he submitted to the Porte, through Prince Menshikoff, an ultimatum in regard to the Greek Christians and other matters. England and France prepared to sustain the Sultan against Russia, and stationed their fleets in Besika Bay. In July the Russian forces advanced into the Danubian principalities. The Vienna Note, prepared by Austria and signed by the neutral Powers as a basis of settlement, was so modified by Turkey as to be unacceptable to Russia, and on October 4, 1853, Turkey declared war. The English and French fleets thereupon passed through the Dardanelles. Though the Turks were at first victorious upon land, the Russian admiral, Nakhimoff, won an important naval victory at Sinope, November 30; on March 12, 1854, France and Great Britain concluded an alliance with Turkey, and two weeks later they declared war against Russia. Prussia stood firmly neutral. Austria, though desirous of checking the Russian advance across the Danube, dared not become involved in a war on the east, leaving its western frontiers open to possible attack by Prussia and other States of the Germanic Confederation, and contented itself, therefore, with mobilizing an army on the southern frontier. The allied Western Powers determined to assist the Sultan by a naval expedition against Kronstadt, in the Baltic, and by a combined attack with land forces in the south. The Baltic expedition proved a complete failure, achieving nothing beyond the capture of Bomarsund on August 16.

Early in the summer 20,000 English troops, under Lord Raglan, and 50,000 French soldiers, under Marshal Saint-Arnaud, assembled at Varna, on the Black Sea. Against the advice of the Turks, who wished to drive Russia out of the Caucasus, Saint-Arnaud and Raglan decided upon the siege of Sebastopol, Russia's stronghold and depot in the Crimea. The war was thus narrowed down to a limited sphere, and was fought in a long siege and a series of stubborn engagements. The first of these occurred at the river Alma, on September 20, 1854, six days after the landing of the Allies. Saint-Arnaud died on September 29, and was succeeded by General Canrobert. At the beginning of October the Allies began the regular siege of Sebastopol, the defense of which was directed by Todleben. On October 25th the Russians attacked the British at Balaclava (q.v.). The engagement was marked by bad generalship on the British side, and by the gallant but ill-advised charge of the Light Brigade. The Russians followed this up with an unsuccessful attack at Inkermann on November 5. The severe winter caused the suspension of active operations, and the English and Turks endured terrible hardships because of the inadequate commissary arrangements. During the winter an international conference attempted to adjust matters, but without avail. Austria entered into an alliance with France and Great Britain; but as Prussia could not be drawn into action unfavorable to Russia, Austria refrained from entering into hostilities. Sardinia, on the other hand, joined the Allies in January, 1855, and sent 10,000 men of her new army, under General La Marmora, to the Crimea. (See CAVOUR and ITALY.) The Russians resumed activities in February, assailing the Turkish positions at Eupatoria, but without result. After the death of the Emperor Nicholas and the accession of Alexander II., in March, 1855, Prince Michael Gortchakoff succeeded Prince Menshikoff in command of the Russian forces.

Operations were renewed with great vigor in the spring, the Allies having 174,000 men in the field and the Russians about 150,000. General Pélissier succeeded Canrobert in command in May, and General Simpson succeeded Lord Raglan, upon the latter's death in June. A Russian army, advancing to the relief of Sebastopol, was defeated at the Tchernaya on August 16. From the 19th of August to the 8th of September a terrible bombardment of the besieged city was kept up, and was followed on the latter day by a general assault, in which the French took the Malakoff Tower and the British took the Little Redan. Gortchakoff now blew up the southern fortifications and evacuated the city, retiring into the hills. General Muravieff captured Kars, in Armenia, on November 28. All the parties were ready for peace, which was signed at Paris, where a congress of the Powers had been in session, on March 30, 1856. The integrity of the Ottoman Empire was guaranteed by the Powers, which also renounced all right of intervention in Ottoman affairs; reforms were promised by the Sultan; Russia renounced her protectorate over the Danubian principalities, and ceded a strip of Bessarabia to Moldavia; the navigation of the Danube was declared free to all nations under the supervision of a commission of members from the bordering States; the Black Sea was neutralized. The Congress

united in the Declaration of Paris (q.v.), which laid down certain principles of international law. Consult: Hanley, *The War in the Crimea* (London, 1891), the best short treatment in English. The standard work is Kinglake, *The Invasion of the Crimea* (9 vols., London, 1863-87); also Russell, *The War in the Crimea, 1854-56* (London, 1855-56); Marx, *The Eastern Question, 1853-56*, trans. by E. M. and E. Aveling (London, 1897); Lodomir, *La guerre de 1853-56* (Paris, 1857); Lysons, *The Crimean War from First to Last* (London, 1895); "Russian Side of the Crimean War," *National Review* (November, 1864); Kovalevski, *Der Krieg Russlands mit der Türkei in den Jahren 1853-54* (Leipzig, 1869).

CRIME DE SYLVESTRE BONNARD, krém de sêl'vês'tr' bôn'nâr', LE. A graceful romance by Anatole France (1881). The hero, M. Bonnard, is an old member of the Institute, whose 'crime' consists in releasing a young girl from a boarding-school in which she was unhappy, and bringing about a happy marriage for her.

CRIMINAL LAW. A phrase signifying the body of legal rules which define criminal offenses, prescribe their punishment, and provide for the apprehension and trial of persons charged with crime. The tendency at present is to codify this branch of the law. In New York, for example, the substantive part of criminal law—that is, the part which defines criminal offenses and their penalties—is embodied in a Penal Code, while the adjective part, or the part regulating the arrest and trial of offenders, constitutes the Code of Criminal Procedure. The Constitution of the United States and the various State constitutions contain important provisions relating to criminal procedure. See especially the Fifth and Sixth Amendments of the United States Constitution, and similar clauses in the State constitutions, securing a jury trial, indictment by a grand jury, and other rights to persons charged with crime.

The more important criminal offenses are dealt with under their respective titles.

BIBLIOGRAPHY. Blackstone, *Commentaries on the Laws of England*; Bishop, *New Criminal Law* (Boston, 1900); Robinson, *Elements of American Jurisprudence* (Boston, 1900); also the *Encyclopedia of the Laws of England* (London, 1897); Archbold, *Pleading, Evidence, and Practice in Criminal Cases* (2d ed., London, 1900); Harris, *Principles of Criminal Law* (8th ed., London, 1899); Pollock and Maitland, *History of English Law* (2d ed., Boston, 1899); Stephen, *History of the Criminal Law of England* (London, 1883); id., *General View of the Criminal Law of England* (New York, 1890); Phillips, *Comparative Criminal Jurisprudence* (Calcutta, 1889). See LAW, CRIMINAL. Consult also the authorities referred to under other subordinate or related titles, such as INSANITY; JURISPRUDENCE; CRIMINOLOGY; PENOLOGY; etc. See ACCESSORY; INDICTMENT; PLEADING; PRINCIPAL; PROCEDURE; PUNISHMENT.

CRIMINOL'OGY (from Lat. *crimen*, crime + Gk. *λογία*, *logia*, account, from *λέγω*, *legein*, to say). The science which treats of the nature and causes of crime. As a separate study it is of comparatively recent growth, and the credit for its foundation as an independent branch of

knowledge is usually given to Cesare Lombroso (q.v.), an Italian professor in the University of Turin, who in 1876 published a remarkable book entitled *L'uomo delinquente* (Criminal Man). Since its appearance, quite a number of eminent scientists—physicians, jurists, economists, and sociologists—have taken up the study of crime and criminals. There is, however, such a difference of opinion concerning the fundamental causes or factors of crime that criminologists are divided into several groups. These groups may be classified under two large divisions, their difference turning upon the emphasis laid upon the individual causes of crime, on the one hand, or upon its social causes, on the other hand. The criminal, one party asserts, is born, not made; he is a criminal by nature, and the circumstances of education or environment have little or nothing to do with his law-breaking career. The opposing party maintains that social organization, education, environment—causes lying outside the individual—really determine whether or not he will become a criminal. As a rule, those who adhere to the former point of view conceive the study of crime as a part of anthropology, a part of the study of man; while those who believe that social conditions furnish the causes and explanation of crime consider this study a part of sociology. Thus the two terms usually applied to criminology, 'criminal anthropology' and 'criminal sociology,' each indicate a prejudice in favor of one or the other of the tendencies characterized above.

The subject of criminology is a complicated and difficult one. It is only within the present generation that the possibility has arisen of conducting the study of criminal problems on anything approaching an exact and scientific basis. Before the introduction of a system of criminal statistics it was impossible to ascertain whether crime was increasing or decreasing, what transformation it was passing through in consequence of the social, political, and economic changes constantly taking place in all highly organized societies, and what was the effect of punishment on the criminal population. Statistics, moreover, even when carefully collected, often mislead. Suppose, for example, that the number of convictions for crimes and misdemeanors has increased in Belgium from 22,359 in 1870 to 40,372 in 1890; this does not necessarily mean that crime has increased, for the total population may have increased more rapidly than the number of offenses, and in such an event criminality has really diminished. The larger number of convictions in 1890 may, perhaps, be due to an increase in the number of punishable offenses because of the enactment of severer laws; certain acts legally permissible in 1870 may have become misdemeanors in 1890. Another possible explanation of a merely apparent increase in criminality is offered by the fact that perhaps the police have become more efficient or more vigilant, and that therefore many offenders who escaped in 1870 are now brought before the courts and condemned. These three possible explanations are sufficient to show how careful we must be in the employment of criminal statistics. Particularly when we go beyond the statistics of a single nation and attempt to compare two or more nations with a view to their relative criminality, we must be even more cautious. In no two countries is the criminal law the same,

and an act which is perfectly harmless when committed in one country is considered in another as a contravention of the law. Each country has also a nomenclature of crime and methods of criminal procedure peculiar to itself. In each country the police are organized on a different principle and act on a different code of rules. Great differences of opinion exist also among different nations as to the gravity of certain offenses. Whenever it shall be possible to collect criminal statistics in the several nations according to a uniform system, then criminology will have the necessary inductive basis for fruitful comparisons between nations.

The narrow legal definition of crime as a violation of the law is scarcely of any value for philosophical purposes; and a scientific definition which shall include all acts which at any time have been called crimes, but include none other—which shall, moreover, specify their common characteristics—remains yet to be found. It seems highly probable that the study of primitive religious ideas and primitive social organization will throw considerable light upon the problem of discovering the essential nature of crime. It should be noted, meanwhile, that originally the question whether a certain act was criminal or not, and if criminal, how the perpetrator should be punished, was answered by the offended party—individual, family, or clan—and not by the political organization of the whole people (the State). That the State should determine these matters and reserve to itself the right to judge and to punish is a result of quite recent evolution. Even to-day, the State is far from being the only coercive institution; duels, and, in a measure, lynching, are survivals of the previous status.

The question whether crime is increasing has been very widely discussed, pro and con; there appears to be a general opinion among experts that it is increasing. Certainly criminal statistics everywhere seem to bear out this view, with the possible exception of England; and even there, Mr. W. D. Morrison maintains, in his book on *Crime and Its Causes*, the total volume of crime is on the increase. According to the eleventh census of the United States, it appears that the criminal class in our country has increased from 1 in 3500 of the population in 1850 to 1 in 786.5 in 1890, or 445 per cent., while the total population has increased but 170 per cent. in the same period.

CAUSES OF CRIME. The factors responsible for crime may conveniently be divided into three great categories—cosmic, social, and individual. The cosmic factors of crime are climate and the variations of temperature; the social factors are the political, economic, and moral conditions in the midst of which man lives as a member of society; the individual factors are those attributes inherent in the individual, such as descent, sex, age, bodily and mental characteristics. It is often extremely difficult to disentangle these factors; many of them, indeed, are indirectly at work where they appear to be absent. Heredity, for example, seems to belong clearly to the individual factors; but if we trace an inherited characteristic back through a long line of ancestors, it may finally be found to have its origin in the circumstances of environment or education. It has been aptly remarked that a

man's education should begin with his grandfather.

COSMIC FACTORS. How profoundly the physical structure, and likewise the mental life of man, is affected by his natural surroundings, by climate, seasons, soil, the configuration of the earth's surface and the nature of its products, is illustrated by the low type of life exhibited by the primitive inhabitants of inhospitable, barren countries. Concerning the influence of climate on crime, statisticians have concluded that crimes against the person, as assault and homicide, are relatively more numerous in warm climates, while crimes against property are more frequent in colder regions. The statistics of homicide in Europe show that the warmer countries, Italy and Spain, head the list in the proportion of murders to the population, while England, Scotland, and Holland stand at the bottom of the list. Prof. Enrico Ferri, after a thorough examination of French judicial statistics for a series of years, concludes that a maximum of crimes against the person is reached in the hot months, while crimes against property come to a climax in the winter. Crimes against the person are unduly high in the south and west of the United States; but here we have to consider not merely climate, but also race conflicts, pioneer conditions, and uncertain legal control.

SOCIAL FACTORS. Concerning the social factors of crime, it must be observed that the action of society upon the individual is so complex that it will here be impossible to discuss, even briefly, all these factors.

Considering, first, the conjugal condition of criminals, it appears that there is a higher ratio of criminality among the unmarried and divorced than among the married. A partial explanation of this fact may lie in the circumstance that married men and women, being subject to the restraining influences of home life, are much less apt to yield to those anti-social tendencies which manifest themselves in crime.

Considering, secondly, occupation, prison statistics show that the higher the character of a man's daily pursuits the greater the unlikelihood of his falling into crime. An examination into the previous occupations of criminals shows that a very large percentage were engaged in unskilled labor. According to the census of 1890, of 52,894 convicts, 31,426 were ignorant of any kind of trade. The economically low position of the unskilled laborer exposes him to frequent unemployment and want, and hence to the desperation which often leads to crime. French official statistics summarizing the results of over fifty years indicate the following number of indictments for every 100,000 members of each class: Agriculture, 8; liberal professions and proprietors, 9; industry, 14; commerce, 18; domestic service, 29; vagabonds and without trade or regular occupation, 405.

Thirdly, and closely related to occupation, is the influence of rural or city life on crime. In his *Prisoners and Paupers* (New York, 1893), Mr. H. M. Boies declares that our cities furnish 90 per cent. of our criminals. City life, with its crowded slums and tenements, he considers one great cause of crime. Cities are hotbeds of lawlessness as compared with rural neighborhoods. The city is the refuge and hiding-place of questionable characters; it intensifies the

struggle for existence, and by the sharp contrast it offers between rich and poor, between luxury and penury, excites envy and class hatred. According to Levasseur, urban population in France has a criminality double that of the rural population: while according to Mr. W. D. Morrison, London, with less than one-fifth of the population of England and Wales, furnishes one-third of the indictable crimes.

A fourth point of great importance is the influence of poverty. If poverty in itself were a decisive factor, we would expect poor countries to produce the most criminals; but poor countries like Ireland, Spain, and Hungary show a smaller ratio of theft in the population than rich England. It is rather where great poverty exists side by side with great wealth that temptation is greatest and crime most frequent, especially crimes against property. Swift and unexpected industrial and commercial changes and hard times put character to unusual strains and increase the number of law-breakers. Inventions and progress in industrial processes often make it more difficult for men to support existence in their accustomed ways. There can be no doubt, moreover, that the keen struggle for existence imposed upon the poor classes disorganizes the family and destroys many of the beneficent influences of home life. It may reasonably be maintained, on the other hand, that excessive wealth, with the idleness that it frequently begets in the possessor, is quite as apt as destitution to lead to viciousness and crime. A wealthy criminal has, of course, more numerous and efficient means for escaping detection and punishment than a poor offender. Humanitarian novelists have accustomed the general public to the belief that hunger and pressing want frequently lead to theft. This belief does not by any means coincide with such facts as we possess; French criminal statistics indicate, for example, that thefts of food—bread, flour, meat, etc.—constitute only $5\frac{1}{2}$ per cent. of the total number committed during the period from 1830 to 1860.

Among the other factors of crime which may properly be classed as 'social' are: the influence of social theories which tend to engender contempt for human life and the institution of private property; the absence of a widespread, deep-seated religious spirit which restrains men from yielding to evil impulses; the corruption of partisan politics which permits the worst elements of the population to become the official guardians of the public peace and prosperity; lynching and public exhibitions of cruelty which debase human character; detailed accounts of crimes in the daily press; the influence of association and suggestion by which gangs of shiftless men or boys form centres of criminal life under the leadership of unscrupulous chiefs; social disturbances like war, crises, revolutions, and expositions, which disturb the even tenor of social progress and relax the social bond.

INDIVIDUAL FACTORS. Finally the individual factors of crime should be briefly considered. They have been carefully studied by a score of scientists, beginning with Lombroso, the founder of criminology, who was disposed at first to overlook all but the individual factors. *See*.—In all civilized nations women are less addicted to crime than men, and girls less than boys. Among most European peoples between five and six males are tried for offenses against the law to

every one female. Women are less inclined to acts of violence than men on account of their physical weakness, but when women do become criminals their crimes are frequently characterized by a cruelty and relentlessness not found in male offenders. The crimes of women are mostly infanticide, abortion, poisoning, domestic theft. They are addicted equally with men to the perpetration of parricide, and more frequently convicted than men of parricide. Women are also more hardened criminals than men, probably because a woman may regain her rank in society only with the greatest difficulty. *Age*.—In proportion to the population crime is, as we should expect, at its lowest level from infancy till the age of sixteen. From that age it goes on steadily increasing in volume till it reaches a maximum between thirty and forty. Females do not enter upon a criminal career so early as males, and the criminal age is earlier in coming to a close for women than in the case of men. *Education*.—The question whether education reduces or increases criminality is far from being conclusively answered. Those States which have the best systems of education have also the most criminals in their jails and prisons. But as a rule the proportion of our prison population unable to read or write is considerably higher than in the free population. M. Henri Joly, an eminent French criminologist, maintains that most frequently passions and vices which have nothing to do with instruction are the veritable motives of crime. It seems reasonably certain, however, that the lack of instruction in manual and trade processes and the absence of personal, moral, and spiritual influences accounts for much of the tendency to crime. *Drunkenness*.—All authorities agree that intemperance is a serious cause of crime. It weakens the will, leads to evil associations, dulls the conscience. Statistical information concerning this point is usually non-official and of little scientific value. *Hereditary*.—Individual degeneracy, which Dr. Ferri has shown to be closely connected with crime, is frequently passed on from generation to generation. The diagrammatic history of eight families given by Dr. Strahan in his book on *Marriage and Disease* illustrates the degenerate tendencies transmitted from father to children throughout several generations. Similarly, Dugdale, in his book on the Jukes, has traced the posterity of a criminal and found that the great majority of his descendants possessed vicious or criminal instincts.

Lombroso and his disciples attribute criminality to anatomical, physiological, and psychological peculiarities of the individual, and have inaugurated the study of the criminal as a being separate and different from normal man and woman. The biological peculiarities of the criminal are so marked that Lombroso speaks of a 'criminal type,' and enumerates the characteristics which constitute this type: height and weight above the average; asymmetry of the skull, brain, and face; brain lighter in weight than the normal; light hair; scant beard; retreating forehead; projecting eyebrows and ears; long arms; insensibility to physical pain; pointed skulls; heavy lower jaws; defective lungs; tendency to diseases of the heart and of the sexual organs, etc. Criminal anthropologists, however, are far from agreeing upon these anomalies, and often reach conclusions divergent

from and sometimes contradictory to those of Lombroso. The French sociologist Tarde has very aptly suggested that perhaps the characteristics of the criminal are rather the consequence of his career than the cause; that just as clergymen, military men, and other distinct social professions acquire distinctive traits, so criminals come to adopt certain methods of life and thought which stigmatize them. Consult: Morrison, *Crime and Its Causes* (London, 1891); Rylands, *Crime: Its Causes and Remedy* (London, 1899); MacDonald, *Criminology* (New York, 1893); Kurella, *Naturgeschichte des Verbrechers* (Stuttgart, 1893); Joly, *Le crime. Etude sociale* (Paris, 1894); Marsh, *Crime and the Criminal* (London, 1899); Drählms, *The Criminal, his Personnel and Environment* (New York, 1900), with a list of works on Criminology; Forel and Mahain, *Crime et anomalies mentales constitutionnelles* (Geneva, 1902); and Hall, *Crime in its Relation to Social Progress* (New York, 1902). See LOMBROSO; PENOLOGY; PRISONS; REFORMATORIES.

CRIMMITSCHAU, krīm'mit-shou. A town of the Kingdom of Saxony, on the Pleisse, about 39 miles south of Leipzig (Map: Germany, E 3). It is an important industrial centre, with extensive cotton and woolen mills and machine works. Population, in 1890, 19,972; in 1900, 22,840.

CRIMP (from Dutch *krimpen*, OHG. *chrimpan*, *krimfan*, to bend together, from *chrampf*, Ger. *Krampe*, Engl. *cramp*). The name given to an agent for supplying ships with seamen. They are usually in league with the most disreputable class of lodging-house and saloon keepers and with prostitutes in the endeavor to fleece the sailors as rapidly as possible. The latter can then be forced aboard ship. There are numerous laws for the protection of seamen against the extortion of crimps and their dealings with masters of vessels who need crews, but these laws are unable to reach a very large proportion of cases; and some of the laws, while not greatly injuring the crimp, seriously affect the interests of a sailor who is not in need of legal protection, and those of the honest lodging-house keeper.

CRIMSON. See RED.

CRINED, krīnd (from archaic Engl. *crine*, from Fr. *crin*, Lat. *crinis*, hair). A term in heraldry. When the hair of a man or an animal differs in tincture from the rest of the charge, the object is said to be *crined* of such a metal or color.

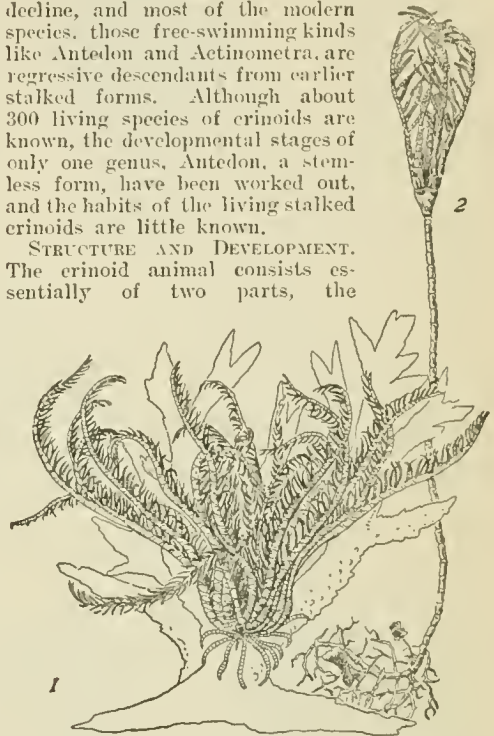
CRINGLE, krīn'g'l. TOM. The hero of Michael Scott's sea tale *Tom Cringle's Log* (q.v.).

CRINGLES (Ger. *Kringel*, Icel. *kringla*, circlet, dim. of *kringr*, pulley, *kring*, round). Short pieces of rope, with each end spliced into the bolt-rope of a sail, commonly confining an iron or brass ring or thimble. Smaller ropes are passed through them to aid in managing the sails. See KNOTTING AND SPLICING.

CRINOIDEA (Neo-Lat. nom. pl., from Gk. *κρinoειδής*, *krinocídēs*, like a lily, from *κρῖνόν*, *krinon*, lily + *ειδος*, *eidos*, form). A class of pelmatozoan echinoderms related to the Cystoidea and characterized by the regular pentamerous arrangement of the polygonal plates of the body-wall, that form a usually stalked calyx, and by the presence of five generally well-de-

veloped flexible arms. The graceful flower-like appearance of the stalked crinoids has given them the names of 'sea-lilies' for the living species, and 'stone-lilies' for the fossil varieties. The group is of great interest both to the zoölogist and paleontologist, but the complex modifications of the plates of the calyx, and the usually imperfect conditions of preservation, make their study a matter of considerable difficulty. At the present time the group is on the decline, and most of the modern species, those free-swimming kinds like *Antedon* and *Actinometra*, are regressive descendants from earlier stalked forms. Although about 300 living species of crinoids are known, the developmental stages of only one genus, *Antedon*, a stemless form, have been worked out, and the habits of the living stalked crinoids are little known.

STRUCTURE AND DEVELOPMENT. The crinoid animal consists essentially of two parts, the



EXISTING CRINOIDS.

Representative species from the Atlantic: 1. *Actinometra pulchella*; 2. *Rhizocrinus Lofotensis*. (After A. Agassiz.)

head, or calyx, and the stem or column. The calyx bears five or ten generally forked pinnulated arms attached to its sides, has upon its upper ventral surface a central mouth and an eccentric or lateral anal opening, and is itself supported by the column attached to its lower or dorsal surface. The calyx is a spherical or cup-shaped box made up of polygonal stony plates that are arranged in more or less regular horizontal series, and in vertical series according to the plan of pentamerous bilateral symmetry so prominent in the higher Pelmatozoa. The calyx contains the body-cavity, in which are the vital organs consisting of the simply coiled alimentary canal, and the central portions of the nervous, generative, and water-vascular systems. Prolongations of these latter systems extend into the arms. These are outgrowths of certain vertical rows of the calyx plates, termed the 'radials,' and are capable of free movement. In many of the earlier, more primitive crinoids, like *Pisocrinus*, the arms are simple: in the more specialized forms, *Pentacrinus*, they are quite complex and fork frequently. In all crinoids the arms bear pinnules and are provided with

cilia. The feathery branches of the arms screen food from the water, while the ciliated grooves transport the food to the mouth through the food-grooves, which are continued over the ventral surface from the bases of the arms to the mouth-opening.

The ventral surface of the calyx in modern genera is usually covered by a tough skin, but in the Paleozoic forms it was often covered by a superficial 'vault' or 'tegmen' of calcareous plates. The mouth is then underneath the tegmen or ventral covering and communicates with the food-grooves of the arms through closed stony tubes. In these genera the plates of the vault are often so arranged as to form an elevated 'proboscis' (*Batocrinus*), at the summit of which is the anal opening, which is thus placed above the ends of the arms. The crinoid stem is attached to the base of the calyx, and consists of calcareous plates loosely joined together to allow of a considerable degree of flexibility. Increase in the length of the stem is accomplished by the growth of new columnar plates between the base of the calyx and the top of the column. In form the columnar plates are discoid, and of circular or pentagonal outline, and all are pierced by a central cavity through which passes the neuro-vascular canal of the column. Most crinoid stems are furnished at their lower ends with root-like branches that serve to anchor the animal in muddy or sandy bottoms; others, *Apioerinus*, have a disk-like expansion that is cemented to rocky surfaces. Several genera, especially in later geologic and modern times, have columns supplied with lateral branches, called 'cirri,' which are similar in construction to the stem itself. The pentacrinids have the longest stems known, some of the fossil forms from the Upper Lias rocks of Württemberg having been found with stems ranging from 15 feet to the extraordinary length of 50 feet. Some forms of crinoids, such as *Agassizocrinus* of the Carboniferous, *Untacrinus* of the Cretaceous, and *Antedon* of recent seas, have no stem and are free-swimming animals, using their arms for locomotive purposes. *Untacrinus* is the most remarkable of these, for with a body only two or three inches in diameter, it has delicate feathery tentacles nearly six feet long, that served both as swimming-organs and as food-screens. Living *Antedon*, without a stem, has a whorl of cirri at the base of the calyx, and by means of these it anchors itself to the bottom. In other stemmed forms, as *Woodocrinus* from the Carboniferous, the base of the stem appears never to have been attached, as it ends in a simple point.

The development of Crinoidea is known for only one genus, *Antedon*, the feather-star, and this cannot be considered as typical of the class as a whole, as it presents a case of regressive development. *Antedon* appears from the egg as an elliptical free-swimming larva that is crossed by four transverse ridges, has a posterior bundle of bristles and a lateral mouth, and that resembles in many respects an annelid larva. This larva increases in size, and inside of it develops an animal with the form of a cystoid, with a head of loosely jointed perforated plates, a column, and a basal columnar plate. For a time this stalked larva is attached, and it resembles a primitive crinoid, but soon the stem is absorbed and the animal assumes the form

of the adult free-swimming *Antedon*. Almost nothing is known of the ontogeny of the host of fossil crinoids.

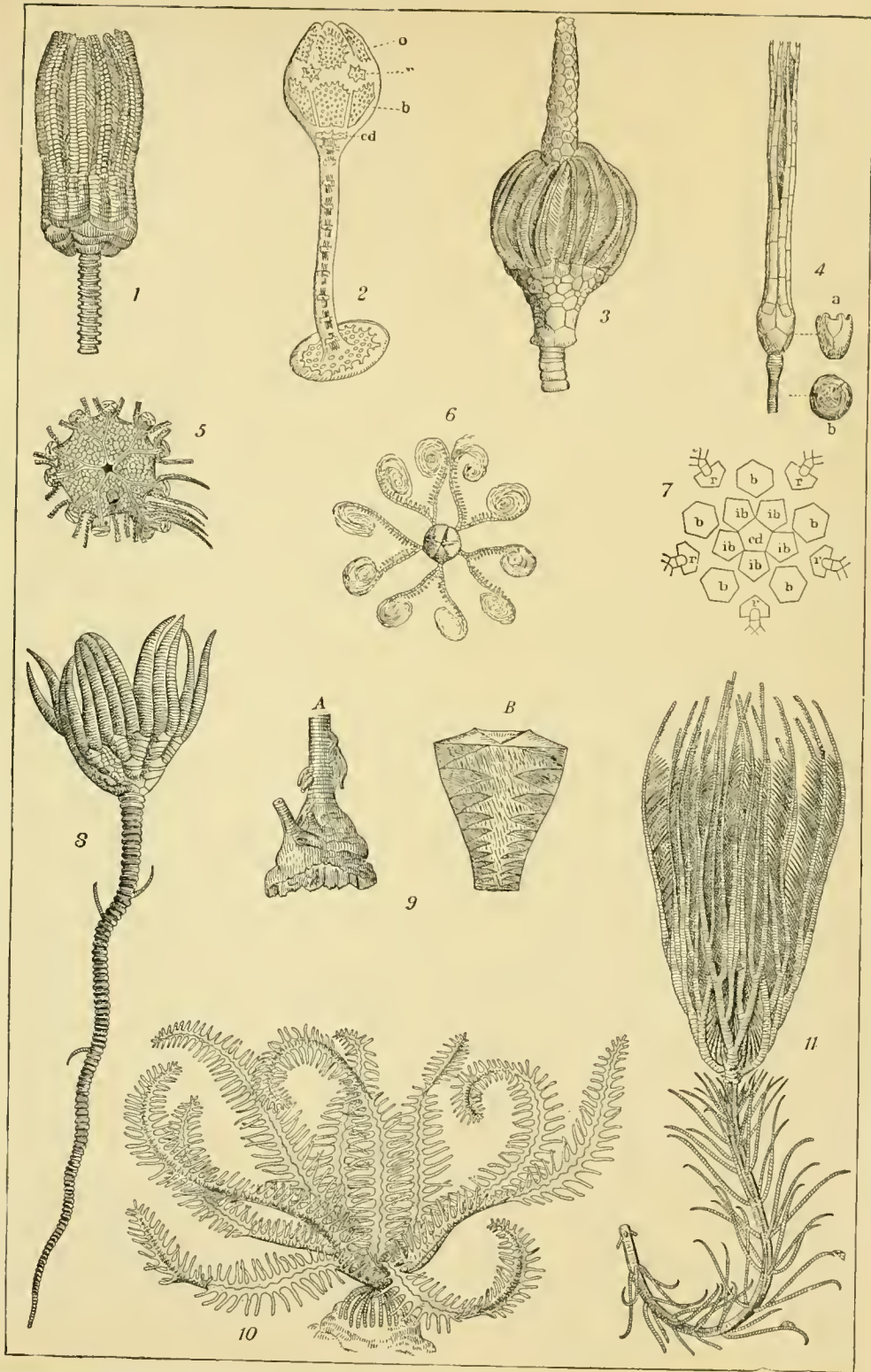
HABITS AND DISTRIBUTION. The modern Comatulide, like *Antedon*, *Actinometra*, etc., have a very wide distribution, and are usually found in waters less than 150 fathoms in depth, although one species of the *Antedon* has been dredged from the great depth of 2900 fathoms. The habits of *Antedon* are best known. It is a gregarious animal and Verrill has obtained 10,000 individuals in a single trawl in the North Atlantic. It lives mostly in the upper layers of the water, but when exposed to the direct rays of the sun, it curls up its arms and sinks. When clinging by its cirri to a coral or rocky point and disturbed, it releases itself immediately and swims away by graceful movements of the arms, or crawls on its arms like a spider over the bottom. Sudden changes of temperature stun it; it sinks to the bottom and soon dies. When these animals find themselves in uncomfortable surroundings, as when taken in the dredge and placed in aquaria, they drop off their arms, which break at specially fused joints, called 'syzygies,' but the arms are restored through regeneration if the crinoid survives. The stalked crinoids are also gregarious animals, but they are more restricted in their distribution, and inhabit deeper waters. The majority of fossil stalked crinoids are found in rocks that were undoubtedly comparatively shallow-water deposits, and because the calcareous plates of the calyx, and to a lesser degree those of the stem, fall readily apart after the death of the animal, perfect specimens are quite rare finds. The food of crinoids has been ascertained to consist of minute crustaceans, diatoms, spores of algae, foraminifera, and radiolarians.

Fossil Crinoids. About 175 genera and 2000 species of fossil crinoids are known. They appear first as very simple forms in Ordovician rocks, and they increase rapidly, becoming important elements of the faunas in the Silurian, Devonian, and Carboniferous periods. In some regions they were exceedingly abundant, for their fossil remains form great beds of limestone known as 'crinoidal' or 'crinoidal limestone,' which are found in formations of various ages. In the Silurian system alone, about 400 species, distributed among 70 genera, have been obtained from mostly three localities: the island of Gotland, the Wenlock of England, and the Niagara group of North America. Some of the more characteristic genera are *Pisocrinus*, *Crotalocrinus*, *Calceocrinus*, *Calli-*

EXPLANATION OF PLATE.

1. An encrinite (*Encrinus*), fossil in the Trias.
2. Larva of a feather-star (see Figs. 10 and 7).
3. *Batocrinus pyri-formis*, fossil in the Subcarboniferous of Iowa.
4. *Pisocrinus flagellifer*, fossil in the Silurian of Gotland; a, posterior view, of a perfect calyx; b, calyx seen from one side.
5. Type of calyx with a coriaceous skin in which calcareous plates are imbedded.
6. A free-swimming crinoid (*Sacomya pectinata*), fossil in the Upper Jurassic lithographic slates of Bavaria.
7. Diagram of arrangement of principal pieces in the calyx of a crinoid: b, basals; ib, infra-basals; r, radials; cd, centrodorsal (compare Fig. 2 where the letters are the same, plus o, orals).
8. *Woodocrinus macrodactylus* from the Carboniferous of Yorkshire, Eng.
9. *Apocrinus*, A, longitudinal section through the uppermost stem-joints of *Apocrinus Parkinsoni* (Oöllitic), showing empty spaces between them; B, restoration of the base of another species (*Apocrinus Rossianus*, Upper Jura).
10. A feather-star (*Antedon rosacea*) now living on European coasts; Fig. 2 is the base of this, showing developing plates (see Fig. 7) of the calyx. See article FEATHER-STAR.
11. An existing deep-sea 'stone-lily' (*Metacrinus interruptus*).

CRINOIDS



erinus, and Eucalyptocrinus. In the Devonian system some localities have yielded good material. The Lower Carboniferous rocks of the upper Mississippi Valley are the most renowned sources of fossil erinoids. The shaly limestone beds at Burlington, Iowa, and Crawfordsville, Ind., have furnished hosts of finely preserved specimens, which are to be seen in geological collections all over the world. The Mesozoic rocks of Europe, especially the Liassic and Jurassic, have furnished some fine examples of Eucrinus, Apioerinus, and the pentacrinids, but the rocks of this era in America hold only rare occurrences of members of this class. The only find of note—and that was one of great importance—was that of Uintacrinus in the Cretaceous chalk of western Kansas. The Tertiary rocks seem to be poor in fossil remains of this group.

BIBLIOGRAPHY. General descriptions of the class, and notes on the habits of the animals, can be found in: Agassiz, *Three Cruises of the Blake*, vol. ii. (Boston and New York, 1888); Walther, *Einleitung in die Geologie als historische Wissenschaft* (Jena, 1893-94); Neumayr, *Die Stämme des Thierreiches*, vol. i. (Vienna and Prague, 1889); Parker and Haswell, *Textbook of Zoölogy*, vol. i. (London and New York, 1897); Carpenter, "Report on the Crinoidea," in *Challenger Reports, Zoölogy*, vol. xi., No. 26, and vol. xxvi., No. 60 (London, 1884-88). For description of the fossil forms, consult: Zittel and Eastman, *Textbook of Paleontology*, vol. i. (London and New York, 1900); Bather, "The Crinoidea," in Lankester's *Treatise on Zoölogy*, part ii. (London, 1900); Wachsmuth and Springer, "Revision of the Palæocrinoidea," *Proceedings of the Academy of Natural Sciences at Philadelphia*, for 1879, 1881, 1885, and 1886; "North American Crinoidea Camerata," *Memoirs of the Museum of Comparative Zoölogy at Harvard College*, vols. xx. and xxi. (Boston, 1897); Bather, "The Crinoidea of Gotland," *Kongliga Svenska Vetenskap Akademien Handlingar*, vol. xxv. (Stockholm, 1892); Lang and Bernard, *Textbook of Comparative Anatomy*, part ii. (London and New York, 1896); Weller, "The Paleontology of the Niagara Limestone in the Chicago Area, The Crinoidea," *Bulletin No. iv. of the Natural History Survey, Chicago Academy of Sciences* (Chicago, 1900); Bather, "On Uintacrinus: A Morphological Study," *Proceedings of the Zoölogical Society of London*, vol. 1895 (London, 1896). See also articles on ECHINODERMATA; CYSTOIDEA; PENTREMITES.

CRINOLINE (Fr., from Lat. *crinis*, hair + *linum*, flax). A name originally given by French dressmakers to a fabric made of horsehair, capable of great stiffness, and employed to distend women's attire: it is also applied in a general way to those structures of steel wire or hoops by means of which women some years ago were able to wear skirts of extraordinary size at the bottom. The first device for producing an expansion of the dress-skirt is the *fardingale*, introduced by Queen Elizabeth. Walpole, in his fancy descriptions of her, speaks of her "enormous ruff and vaster fardingale." The upper part of the body was incased in a cuirass of whalebone, which was united at the waist with the equally stiff fardingale of the same material, descending to the feet, without a single fold, in the form of a great bell. In the end of the reign of James I. this fashion gradually declined, and, as a result of the Puritan feeling in the time of Charles I.

and Cromwell, it quite disappeared. It is next heard of in 1711 as 'that startling novelty the hoop petticoat,' which differed from the fardingale in being gathered in at the waist. About the year 1796 hoops were discarded in private life, but were still the mode at Court, where they flourished until the time of George IV., when they were abolished by royal command.

The next development of this fashion, about the middle of the nineteenth century, began with crinoline in its original and proper sense, first in the form of the 'bustle' in the upper part of the skirt, then the whole petticoat. The hoops were sometimes made with a circumference of four and even five yards. At last, after indignation and ridicule had for years assailed the monstrosity in vain, and when people had ceased speaking about it, the inflation began, about 1866, without any apparent cause, to collapse: and, rushing to the opposite extreme, ladies might be seen walking about as slim as if merely wrapped in a morning gown. At the close of the nineteenth century the name crinoline was applied to a cotton gauze stiffened with a dressing of glue and sold by the yard for use by milliners and dressmakers.

CRINUM (Neo-Lat., from Gk. *κρίνον*, *krinon*, lily). A genus of bulbous-rooted plants of the natural order Amaryllidaceæ, having long tubular flowers. It contains a considerable number of species, natives of different tropical and subtropical countries, generally with umbels of large and beautiful flowers, some of them among the most admired ornaments of our hot-houses. *Crinum amabile*, an Indian species, is much esteemed. The plants are mostly cultivated in greenhouses, although *Crinum longifolium* is semi-hardy and, with slight protection, will endure the winters as far north as Washington. Numerous hybrids have been produced, some of them of exceeding beauty and possessing exquisite perfume. *Crinum Americanum* is a native of Florida.

CRIPPLE CREEK. A town and county-seat of Teller County, Col., 30 miles west-southwest of Colorado Springs; on the Midland Terminal Railroad, connecting with the Colorado Midland Railroad, and on the Florence and Cripple Creek Railroad (Map: Colorado, E 2). It was founded in 1890 as a mining town, developed rapidly after 1893, and was nearly destroyed by fire in 1896. The district in which it is situated is a complete network of gold-bearing veins, and mining gave rise to the subsequent founding of Anaconda, Victor, Altman, Lawrence, and other near-by towns. The value of the production of this section, six square miles in extent, has increased from \$200,000 in 1891 to \$2,400,000 in 1893, \$7,200,000 in 1895, \$12,500,000 in 1897, \$19,743,000 in 1899, and \$22,500,000 in 1900, the output being almost entirely gold. The mines have attracted world-wide attention from metallurgists, owing to the peculiar nature of the ores, which has necessitated new methods of treatment. A noteworthy feature in connection with the industrial activity of the district is the extensive use of electrical power. Cripple Creek, at an elevation of 9800 feet among the mountains, is known also for its attractive scenery. Population, in 1900, 10,147, though the whole district contains about 50,000.

CRIPPLEGATE. An ancient London gate probably dating from the restoration of the walls by King Alfred in 886. It is said to have taken

its name from the lame beggars who congregated there, in A.D. 1010, to touch the body of Edmund the Martyr, as it was passing through. It was twice rebuilt, and was pulled down in 1760. The name was also applied to the district round it.

CRIPPLE OF FEN'CHURCH, THE. The second title of *The Fair Maid of the Exchange* (q.v.), a play by Heywood.

CRISIS (Lat., from Gk. κρίσις, *krisis*, decision, from κρίνω, *kriainō*, Lat. *cernere*, to decide). A name used by the older physicians to denote the rapid or sudden determination of an acute disease in the direction of convalescence or of death. It is opposed in signification to lysis (*lūo*, I relax), which denotes the gradual subsidence of the symptoms and improvement in condition in most chronic and in some acute diseases. The doctrine of crises was closely bound up with that of a *materies morbi*, or material of disease, in the blood, which was presumed to be undergoing changes, during the whole course of the malady, tending to an evacuation of some kind from the system in the form of a critical discharge (*apostasis* or *abscess*), which, when observed, was supposed to contain the matter of disease in a state of *coction*, and to be the direct cause of the sudden relief of the patient. Thus, according to the character and seat of the critical discharge, it was common to speak of a crisis by sweating, by diarrhoea, by expectoration, by urine, by parotid swellings, etc.; and no crisis was considered regular that was not attended by some symptom of this kind. Another curious doctrine associated with that of crises was the belief in certain days as ruling the beneficent or injurious, the complete or incomplete character of a crisis. The seventh, fourteenth, and twentieth (according to some, the twenty-first) days of the disease were regarded as eminently critical; less so, but still favorably critical, were the third, fifth, eleventh, and seventeenth; the fourth day was the *indicator* of a complete crisis on the seventh; the sixth day was the *tyrant*, notorious for unfavorable crises; the second, eighth, tenth, thirteenth, and the rest were non-critical. Few physicians now use the term, except in periodic diseases such as malaria, or in diseases which run a certain course, such as typhoid fever.

CRISIS. A series of patriotic writings, fourteen in number, published by Thomas Paine at Philadelphia during the Revolution. They appeared at intervals from 1775 to 1783.

CRISIS, ECONOMIC. A term employed by economic writers somewhat loosely to designate either the acute phase or the whole course of the disturbances in economic life which have characterized the last century, and which have recurred with such frequency as to make them appear inevitable results of the modern industrial order. The phenomena involved are so complex that they must be described rather than defined.

The salient fact in the economic history of recent times is the alternation of prosperity and depression, of good times and bad. A period of prosperity with expanding business, great activity in production and commerce, is brought suddenly to a close, generally by the failure of a prominent banking house, bringing with it the fall of other financial and mercantile concerns. Business is paralyzed, creditors demand the payment of claims, and debtors find it next to impossible to secure the means of payment. Panic rules, and

for a time the whole mercantile structure threatens to collapse. From such a shock business recovers but slowly, its activity is reduced to the lowest ebb, and some time elapses before the restoration of confidence takes place. This period of depression is much more prolonged than the acuter phase which precedes it. After a time business revives and begins to expand. Prices rise and activity becomes greater. A wave of prosperity again appears which seems to carry everything before it until it, in turn, is checked suddenly, and a new crisis is at hand. Lord Overstone, in an oft-quoted passage, describes these successive phases as follows: "State of quiescence, improvement, growing confidence, prosperity, excitement, overtrading, convulsions, pressure, stagnation, distress ending again in quiescence."

In the absence of any general term to designate this related sequence of phenomena, the term crisis has frequently been used to embrace them all. Strictly speaking, it should doubtless be confined to the acute stage when the collapse which has been slowly preparing actually takes place. In like manner, the term panic applies to the same movement, but expresses it more subjectively, emphasizing how men feel and act rather than the conditions which give birth to those feelings and actions. But as we cannot well break the sequence and discuss in isolated fashion one of its members, it will not be deemed inappropriate to discuss in this article crises, their antecedents, and their consequences.

Crisis are designated as financial, commercial, and industrial. These qualifying phrases mark the places in the economic organism where the disturbance is felt. In a purely financial crisis the stock market is the storm-centre, the disturbance affecting but slightly commercial or productive enterprises. A commercial crisis is of wider area, and embraces the trading classes, while an industrial crisis extends its baneful influence to producers in all lines of agriculture, manufactures, and the like. These expressions do not designate so much different classes of crises as crises of different degrees of intensity, inasmuch as an industrial disturbance will always imply disturbance in trade and the money market, while trade upheavals imply commotion in the money market, though a financial panic does not necessarily imply the others.

While crisis and depression are usually associated, this is not always the case. Panic and crises may occur, and after a brief interval affairs may prosper as before. This is particularly true of the purely financial crises, which are not deep-rooted enough to affect wider areas. The crisis in its larger sense, however, is invariably followed by hard times. On the other hand, depression may occur without a panic. It is hardly correct to say that it is ushered in without a crisis, for the phenomena of such a period can usually be observed even if they lack the spectacular elements which so frequently accompany them. It should be observed, moreover, that crises may be local or general, and while they have many points in common, it is particularly the latter with which we have to deal.

General crises affecting the economic situation of an entire country, and extending themselves to other countries which have trade relations with the former, are peculiarly a mark of the modern organization of business. A century ago

bad harvest or other calamities might cause local distress, or speculation such as was exhibited in the days of the South Sea Bubble and the Mississippi Scheme might cause a panic, but such occurrences did not show the pertinacity and wide-reaching effects which characterize the modern industrial disturbances. That such crises are inevitable consequences of modern methods of doing business and inseparable from the economic activities of our times, seems to be well established by their frequent recurrence and by their greater severity in the most advanced nations.

Crises more or less pronounced occurred in England in the years 1815, 1825-26, 1836-37, 1847, 1857, 1866, 1873, and 1890, while in the United States like disturbances were felt in 1814, 1818-19, 1837, 1857, 1873, 1884, and 1893. The periodicity of these occurrences is marked, and certain writers have gone so far as to establish a normal interval of ten or twelve years between crises. The facts as far as we know them do not warrant us in fixing any absolute rule, though the history of these crises reveals many common features.

It will further be observed that the dates given for Great Britain and our own country coincide in several instances, and if space permitted us to draw upon the history of Belgium, Holland, France, and Germany, further coincidences would be obvious. Certain crises, notably that of 1873, were felt quite generally. The actual crash did not occur in the same month, or even in the same year, in all the countries involved, but it is a frequent occurrence that local circumstances may hasten or postpone an event for which the general conditions are preparing.

The concrete manifestations of a crisis can best be studied in an historical instance, and none is better adapted for this purpose than the crisis of 1873 in the United States. With the close of the Civil War an extraordinary activity in all lines of enterprise was manifested. The public lands had been thrown open to settlement, and large tracts had been granted to the Pacific railroads. This, together with the return of the army to the pursuits of peace, and an enormous increase in immigration, was the condition for an era of speculative development in the Western States. The impulse which had been given to manufactures, not only by the highly protective duties which marked the war tariffs, but also by the depreciation of the currency, which acted as a check upon foreign competition, caused a similar activity in the manufacturing States of the East. Business prospered: prices and profits were high. The census of 1870 showed in every branch of industry a great advance over that of 1860, and the greater part of this advance was in the latter half of the decade. Nowhere was this confidence in the future shown more than in railroad-building and in the iron industry. In 1867 there were 2249 miles of railway constructed; in 1869, 4615; in 1871, 7379. A like expansion of railways had marked the approach of the panic of 1857. In like manner, the outlay for constructing railways rose from \$271,310,000 in 1864-68 to \$841,260,000 in 1869-73. The consumption of pig-iron, which had been 1,416,000 tons in 1868, rose to 2,810,000 tons in 1873. High prices ruled. The maximum prices in the period following 1860 were, it is true, attained in 1866, but if they fell in the years 1867 and 1868 it was only to rise again to a point nearly equal to that of 1866 in 1871 and 1872. The activity in the commercial

centres is reflected in the rise of clearings in the New York Clearing House from twenty-eight billions of dollars in 1868 to thirty-five billions in 1873. The foreign trade of the United States showed a like activity, the aggregate of exports and imports rising from \$609,000,000 in the fiscal year 1868 to \$1,164,000,000 in 1873. But even more significant of the expansion of activity in the United States was the fact of increased importations from abroad. In 1870 the imports exceeded the exports by \$43,000,000, but in 1872 this excess had become \$182,000,000, and in 1873 \$119,000,000.

The crisis of 1873 is usually dated from the failure of Jay Cooke & Co., September 18. The Stock Exchange of New York was closed on the 20th and was not reopened until the end of the month. Clearing House loan certificates were issued in large quantities. There had been certain premonitory symptoms of the approaching collapse. Railroad-building reached its highest point in 1871, pig-iron its highest price in September, 1872. The crisis lasted a few months only, the last Clearing House loan certificates being redeemed January 14, 1874. But there followed a long period of depression, which reached its lowest point three years later. The activities which had marked the previous era were not entirely stopped, enterprises begun had to be finished to save what was already invested, the daily needs of the people must be met, but all enterprise was timid and cautious. The buoyancy of the previous years was gone, and new enterprises were not undertaken. Railroad construction fell off, and in 1875 reached a minimum of 1711 miles, while in the period 1874-78 the outlay for construction was only \$357,000,000. Prices fell until 1879, to rise thereafter until 1882. The consumption of pig-iron declined until it reached 1,900,000 tons in 1876. Clearings in New York City fell off from \$35,000,000,000 in 1873 to \$23,000,000,000 in 1874, and reached their lowest point since 1863 at \$22,000,000,000 in 1876. In foreign trade the excess of imports disappeared in 1874.

As the year 1873 marks the outbreak of the crisis, so the year 1876 serves to mark the lowest point in the subsequent depression. The whole story of the crisis, its antecedents and results, is succinctly told in the statistics of business failures, as reported by R. G. Dun & Co., as follows:

YEAR	Number	Liabilities
1860.....	2,799	75,054,054
1870.....	3,546	88,242,000
1871.....	2,915	85,252,000
1872.....	4,069	121,056,000
1873.....	5,183	228,499,900
1874.....	5,830	155,239,000
1875.....	7,740	201,000,000
1876.....	9,094	191,117,786
1881.....	4,735	65,752,000
1882.....	6,738	101,547,564
1883.....	9,184	172,874,172
1884.....	10,968	226,343,427
1885.....	10,637	124,220,321

Every crisis, panic, and depression is marked by analogous characteristics. Whatever data are appropriate to show expanding conditions and an inflated condition of business at any particular time and place will exhibit a similar showing. In the United States, particularly since 1840, railroad construction has been a favorite index

of conditions, but before the crisis of 1837 similar activity was shown in canal construction. Before the panic of 1825, in England, there were large investments in manufacturing establishments, while the panic of 1893 was preceded by reckless investments in foreign countries.

A period of depression cuts down the existing stock of goods, and the retrenchment of production, coupled with the constant increase of population, creates a void in the market. To fill this there is a renewed activity; as prices begin to rise, existing plants find it difficult to meet the demand. Plants are remodeled and extended. Preparation for future production on a large scale takes place. Large investments of fixed capital are made in buildings, machinery and the like, and those branches of industry which chiefly serve the purposes of construction, such as the iron industry, make extraordinary advances. Mills and railroads are built to supply an anticipated demand. This is usually overdone, and the facilities of production increase more rapidly than the effective demand for products. Credit is unduly expanded, and it is natural that the money markets feel the first shock when the inevitable readjustment takes place.

While the phenomena of a crisis and its attendant consequences are generally recognized, the widest variety of opinion exists as to the causes of such economic disturbances. Writers are prone to lay stress upon local or temporary conditions, and to generalize from them. In truth, the phenomena of a crisis are so complex, and the conditions which may aggravate it so numerous, that it is not surprising to see the latter considered as primary causes. Thus, speculation, the currency, the tariff, bad harvests, have all been made responsible for crises. These are frequently concomitant forces impelling a crisis, but crises are so numerous that there must be some deeper underlying cause. It has already been noted that panics are most severe in the most advanced and most rapidly developing countries. They are apparently an incident of a *changing* economic organization. Stationary nations do not feel them. A change in the economic organization of a nation is not the result of plan, but the resultant of individual initiation in trade and industry. The adoption of new machinery, of new motive power, and new means of communication displaces the old, and renders some portions of capital useless. This waste of capital, and its absorption in enterprises not immediately remunerative, disturbs the normal relations of capital to employment and causes crises. We come, in short, to the conclusion that crises are caused by a lack of coincidence in the laws of growth, of production, and consumption. Changes in the former are rapid, those of the latter slow and gradual. Production is always prone to advance more rapidly than consumption. This proposition seems at variance with accepted theories of political economy, but in reality it harmonizes with them. The struggle for existence which lies at the root of economic life is a contest between Nature's limitations and potential consumption, which is unlimited. But concrete consumption and potential consumption are two different things. Indeed, we seem to be drawing near the familiar proposition that crises are caused by overproduction. This proposition has been vigorously opposed by those who have taken it in an absolute sense, and have revolted at the

idea that production could ever outstrip man's needs, as implying man's incapacity for further development. But if we understand overproduction as a false distribution of products over a series of years in comparison with man's actual consumption, and a false choice of objects of production in comparison with man's potential consumption, we need not revolt at the statement that overproduction—along certain lines—is the cause of crises. Such a statement of the causes of crises seems to lack the precision which characterizes the attribution of crises to definite phenomena, but it must be remembered that the more complex the phenomena to be accounted for, the more general must, of necessity, be the cause to which they are ascribed.

BIBLIOGRAPHY. Consult the First Annual Report of the United States Commissioner of Labor, on "Industrial Depressions" (1886); Jones, *Economic Crises* (New York, 1900); Barton, *Financial Crises and Periods of Industrial and Commercial Depression* (New York, 1902). The two works last named contain bibliographies of the subject.

CRISP, CHARLES FREDERIC (1845-96). An American jurist and politician. He was born in Sheffield, England, but came to the United States when a child. He served in the Confederate Army from 1861 to 1864, when he was made a prisoner. He was admitted to the bar in 1866, and served as Solicitor-General of Mississippi from 1872 to 1877, and as judge of the Superior Court from 1877 to 1882. From this time until his death he was a Democratic member of Congress, and from 1891 until 1895 was Speaker of the House.

CRISPI, KRÉSPÉ, FRANCESCO (1819-1901). An Italian statesman, born at Ribera, in Sicily, October 4, 1819. He studied law at Palermo and was admitted to the bar there, and in 1846 at Naples. He took an active part in the Sicilian uprising of 1848, and after its disastrous issue engaged in journalism in Piedmont. In 1860 he aided Garibaldi in his expedition for the deliverance of the Two Sicilies. He became the first representative of Palermo in the Italian Parliament, began immediately to play a prominent rôle, and after having been the leader of the radical Left, became an exponent of monarchical constitutionalism. In 1876 he was elected president of the Chamber of Deputies. To promote the interests of his country, he visited the European courts in the following year, and soon after was made Minister of the Interior. Denounced by his opponents on a charge of bigamy, he was obliged to resign in 1878, and, although acquitted, did not take office again until 1887, in the Cabinet of Depretis, after whose death, in the same year, he became head of the Cabinet and Minister of Foreign Affairs. He was an earnest advocate of the Triple Alliance (q.v.) between Germany, Italy, and Austria, and in his endeavor to strengthen it visited Bismarck at Friedrichsruhe in 1887, and accompanied King Humbert to Berlin in 1889, conferring also with Caprivi at Milan in the following year. His policy was approved by an overwhelming majority of the electors in 1890, but his Ministry was overthrown on a matter of financial policy in February, 1891. He now resumed his law practice in Rome, and, in the Chamber of Deputies, led the Opposition against his successor in office, the Marquis di Rudini. In 1893 he resumed the

office of Premier, and held it till the defeat of the Italians in Abyssinia in 1896, when he was again succeeded by Rudini (q.v.). In March, 1898, he resigned his seat in the Lower Chamber as a result of the charges brought against him in connection with extensive swindles perpetrated on the Banca d'Italia. Save for a few articles which he published in favor of the Triple Alliance, he took no further active interest in affairs, and he died on August 11, 1901, at Naples. Crispi was the greatest statesman that southern Italy gave to the united kingdom. In his lifetime he was much misunderstood and maligned. Distrusted by the Conservatives as a Radical and Republican, he incurred the hostility of the Republicans by his famous dictum in his letter to Mazzini, March 18, 1865. "Monarchy unites us, while a republic would separate us." From that time he was a firm supporter of the monarchy, but never a friend of the Court. Consult: Stillman, *Francesco Crispi, Insurgent, Exile, Revolutionist, and Statesman* (London, 1899), which contains an estimate as just as a contemporary estimate of a complex character can well be.

CRISPIN. A saint and martyr of the third century, who was descended from a noble Roman family. With his brother Crispinianus, he fled during a persecution of the Christians from Rome to Gaul, where he worked as a shoemaker in Soissons, and distinguished himself by his exertions for the spread of Christianity, as well as by his works of charity. According to the legend, his benevolence was so great that he even stole leather to make shoes for the poor! From this, charities done at the expense of others have been called Crispinades. In the year 287 he and his brother suffered a cruel martyrdom. Both brothers are commemorated on the 25th of October. Crispin is the universally recognized patron saint of shoemakers. Consult: *The Accurate History of Crispin and Crispinianus, the Royal Shoemakers* (Dublin, 1816); and *Saint Crispin and the Gentle Craft* (London, 1868).

CRISPIN. (1) The old name for shoemakers, applied to them from the fact that Saint Crispin was their patron saint. (2) A conventional character in French comedy; introduced, probably, by Poirin in 1654 from Italian comedy. A witty, intriguing, impudent valet-de-chambre.

CRISPIN, RIVAL DE SON MAÎTRE, krě'spān', ré'vāl' de sōn mā'tr' (Fr. Crispin, his master's rival). A lively comedy by Le Sage (1707), with an exceedingly improbable plot and sparkling with wit.

CRISPINEL/LA. A bright, witty girl, a foil to her modest sister Beatrice, in Marston's play *The Dutch Courtesan*.

CRISPINUS. A character in Ben Jonson's comedy *The Poetaster*, representing an inferior poet, intended as a satire on Marston, with whom Jonson was quarreling at the time.

CRISTINOS, krě'stī'nōz (Sp., adherents of Christina). A political party in Spain during the regency of Queen Maria Christina, mother of Isabella II. They were opposed to the Carlists and upheld the Pragmatic Sanction of Ferdinand VII. (q.v.), by which the crown of Spain was made inheritable in the female line.

CRISTOFORI, krě'stō'fō-rē, or **CRISTOFALI,** -fā-lē, BARTOLOMMEO (c.1651-1731). An

Italian harpsichord-maker, and the inventor of the hammer action used in the modern pianoforte. He was born in Padua. After manufacturing instruments in that city until about 1687 he was persuaded by Prince Ferdinand, son of the Grand Duke Cosimo III., to remove to Florence. The instrument invented by Cristofori is well described by Maffei, who also furnishes an illustrative engraving of the action, according to which the regulated rebound of the hammer must undoubtedly be ascribed to him. An authentic grand pianoforte made by the inventor in 1720 is said still to be preserved in Florence. A tablet was erected to the memory of Cristofori in Florence in 1876.

CRITES, krī'tēz. A character in Jonson's play *Cynthia's Revels*, supposed to be 'Jonson's idea of Jonson.'

CRITIAS, krish'i-as (Lat., from Gk. Κριτίας, *Kritias*) (?-403 B.C.). An Athenian orator and poet, the pupil both of Socrates and of Gorgias of Leontini. He was a leader in the oligarchical party at Athens, and was exiled after the downfall of the Four Hundred in B.C. 411, but after the subjugation of Athens by the Spartans he returned, and, in B.C. 404, became head of the Committee of Thirty, known as the Thirty Tyrants. In 403 he was killed in the general revolt against their excesses. His literary activity was varied in the fields of oratory, tragic and elegiac poetry, and historical prose. Fragments of his elegies are in Bergk, *Poeta Lyrici Graeci*, vol. ii. (Leipzig, 1900); of his historical work, in Müller, *Fragmenta Historicorum Graecorum*, vol. ii. (Paris, 1868-83).

CRITIC, THE. A three-act farce by Richard Brinsley Sheridan in imitation of Buckingham's *Rehearsal*, produced at Covent Garden in 1779. It contains a mock tragedy called *The Spanish Armada*, supposedly written by and rehearsed before Puff, one of the principal characters.

CRITICAL ANGLE. See LIGHT, where under *Refraction* this subject is treated.

CRITICAL PHILOSOPHY, or **CRITICISM.** The name applied to Kant's philosophy, because it was not willing to accept all *dieta* that seemed to have the support of reason (see DOGMATISM), but sought to investigate the conditions of the possibility of knowledge and rejected all so-called knowledge that did not conform to these conditions. Consult the authorities referred to in the article KANT.

CRITICAL POINT. Experience shows that there is for every gas a certain temperature above which it cannot be liquefied, no matter how great the pressure exerted upon it. Thus, above 31.1° C. (87.98° F.) it is impossible to liquefy carbonic-acid gas; water cannot exist in the liquid state above 370° C. (698° F.), etc. Such temperatures are termed the critical points or critical temperatures of substances. The vapor-tension of a liquid at its critical temperature is termed the critical pressure, and the specific volume of the fluid at the critical temperature and under the critical pressure is termed the critical volume.

The following table gives the critical temperatures and pressures for some of the more common substances (the critical pressures in terms of pounds per square inch may be obtained by

multiplying the pressures given in the table by 15):

SUBSTANCE	Critical temperature (centigrade)	Critical pressure (in atmospheres)	According to:
Acetic acid.....	+321.5°	57.0	Pawlewski
Acetone.....	+232.8	52.2	Sajoschewski
Acetylene.....	+ 37.1	68	Dewar
Alcohol.....	+243.6	64.34	Ramsay & Young
Ammonia.....	+130	115	Dewar
Carbonic acid.....	+ 31.1	77	Dewar
Carbonic oxide.....	-141	35	Wroblewski
Chlorine.....	+146	93.5	Knietseh
Chloroform.....	+268	54.9	Dewar
Cyanogen.....	+124	61.7	Dewar
Ether.....	+194	35.65	Ramsay & Young
Ethyl acetate.....	+249.5	39.65	Nadejdin
Hydrochloric acid.....	+ 52.3	86	Dewar
Hydrogen.....	-234.5	20	Dewar
Laughing Gas.....	+ 36.4	73.07	Janssen
Marsli Gas.....	- 81.8	54.9	Olzewski
Nitrogen.....	-146	35	Dewar
Oxygen.....	-113	50	Dewar
Sulphurous acid.....	+155.4	78.9	Sajoschewski
Water.....	+370	195.5	Strauss
Wood Alcohol.....	+232.76	72.85	Hannay

Most of these figures must be regarded as correct approximately, for different investigators disagree as to their precise value. As to the critical volume, it must be remembered that when a liquid is ordinarily heated, it expands as the temperature rises, i.e. its density continually diminishes: at the same time the density of its vapor continually increases; with rising temperature, therefore, the densities of liquid and vapor tend to equalize, and finally, at the critical temperature, the densities become exactly equal. The surface of separation between liquid and vapor then disappears, and the substance assumes the form of a perfectly homogeneous fluid.

The critical point of substances can be taken advantage of for passing from the gaseous to the liquid state of aggregation and conversely in a 'continuous' way, i.e. without having to deal, at any moment during the process, with a mass consisting partly of liquid, partly of vapor, and hence having two different specific volumes. Thus, remembering that the critical temperature of carbonic acid is 31.1° C. and its critical pressure 77 atmospheres, let it be required to transform continuously a given amount of the gas into liquid. To accomplish this we may first heat the gas, say, to 35° C., raise the pressure, say, to 80 atmospheres, and then, keeping the pressure unchanged, let the temperature fall, say, to 20° C.; we will then find the substance entirely liquid; for a sudden liquefaction of the entire mass will have taken place when, during the process of cooling, the temperature of 31.1° is reached; but at no moment will liquid have existed simultaneously with gas. Similarly, if it should be required to transform continuously a given amount of liquid carbonic acid into gas, we might proceed as follows: lower the temperature, say, to 20° C., raise the pressure, say, to 80 atmospheres, and then allow the temperature to rise, say, to 35° C.; we would then find the substance entirely gaseous, without, however, the mass having at any moment during the process consisted partly of liquid, partly of gas.

Continuous changes like those just described have great importance in physical chemistry, because they permit of extending the laws of gases

to liquids, and thus break down the barrier that long seemed to exist between the two states of aggregation. Consider, for example, carbonic-acid gas without reference to its critical point. At a temperature, say, of 18° C. this gas follows pretty closely the law of Boyle and Mariotte, i.e. unless the pressure is too great, the volume is inversely proportional to the pressure. But when the pressure attains 60 atmospheres partial liquefaction sets in, and then the inverse proportionality between pressure and volume is completely destroyed; we might diminish the volume by causing more vapor to turn to liquid, but as long as any vapor at all remains the pressure would remain constant. If we should cause the substance to liquefy entirely, we would find that the pressure could again be raised and the volume of the liquid thus further diminished. Careful investigation would show that there is a certain definite relation between the volume of the liquid and the pressure exerted upon it, but the law expressing this relation would be seemingly different from the law of Boyle and Mariotte. It would therefore seem that the liquid and gaseous states follow entirely different laws, separated from each other by the interval during which a substance is partly liquid, partly gaseous, and during which there is no connection at all between pressure and volume. But from what we said above, it may be seen that the change from gas to liquid, as well as the converse change, can be made to take place continuously, through the critical point, and that such a continuous process involves no interval during which the dependence of volume on pressure is destroyed; for when the critical temperature is reached during the continuous process, the substance is at one instant entirely gaseous and at the very next instant entirely liquid. The specific volumes of liquid and vapor at the critical point being equal, the sudden liquefaction involves no change of volume, and hence the law governing the liquid must evidently form an immediate continuation of the law governing the gas. Consult Van der Waals, *La continuité des états gazeux et liquides* (translation from German by Dommer and Pomey, Paris, 1894; German translation from original Dutch, by Roth, Leipzig, 1881). See GASES, GENERAL PROPERTIES OF; HEAT.

CRITICISM (Fr. *criticisme*, from Lat. *criticus*, Gk. *κριτικός*, *kritikos*, critic, from *κρίνειν*, *krinein*, to judge). Criticism, as the art of judgment, whether favorable or adverse, is applicable in all fields of human accomplishment, and all inventions, all institutions, all life are, broadly speaking, within its scope. It is, however with literature and with art that criticism has most significantly busied itself, with the result that the term has come to mean the interpretative study of these greatest expressions of man's nature. The *Poetics* of Aristotle has for centuries been regarded as the first important work of criticism, and the rules there laid down have maintained their value to this day. Aristotle's manner of approach was the scientific method of induction, and his understanding of the fundamental laws of human nature, his perception of those traits, emotions, and desires which, transcending any one age, belong to the men of all ages, underlaid and formed the firm basis of his criticism. Briefly summarized, Aristotle's chief doctrines were that all art and literature should

have as function the pleasure-giving representation or 'imitation' of what was universal—appertaining to all human nature, and not particularly or insignificantly individual; and that great art was measured by the high and lasting pleasure it afforded to society. To study the impressive works that have stood the test of time—the Bible, Homer, Vergil, Dante, Shakespeare, Milton, and lesser but well-loved poets—in the light of Aristotle's illuminating laws, is to discover how striking in its essence is the similarity in the greatest art; the sameness of man's soul, its passions and aspirations, remaining the keynote of art as it is of life.

The technical side of criticism—questions of metrical and dramatic construction and minor points of style—was approached by Aristotle, and the systematic nature of the *Poetics* is probably the chief reason for the reaction that has now and again set in against what is sometimes termed purely academic criticism. Yet it is just because Aristotle appreciated and showed that all art must have laws that the student will find him so useful; more so even than Plato, whose lightning flashes of interpretation must be ranked with the highest creative critical literature. The critical writers after Aristotle are so numerous—Greek, Byzantine, Latin—and for the most part so occupied with the linguistic phase of composition, that one is glad to pass swiftly by all their rhetorical treatises until there looms up in the third century the figure of Longinus, whose refreshing enthusiasm for the beauty of letters places him above the mechanical student of rules. The most important of his successors were Cicero, Horace, and Quintilian, whose observations on style have been of permanent service. From the time of Quintilian to Dante there is no great name in criticism; nor is this to be wondered at when one reflects that the mediæval attitude toward literature was, on the whole, that of distrust and disapprobation. Dante's poetry has so overshadowed his critical treatises that there are probably many lovers of the *Divine Comedy* who have no conception of the interest of the master's reflections on poetic form and beauty, nor any knowledge of his limitations of the subject-matter of great poetry to love, war, and virtue, or moral philosophy. Of more service than Dante's treatises were the writings of the poets and critics of the Italian Renaissance. Through them the classical tradition was passed on to England and to the rest of Europe; in art and literature, as in science and in politics, the Italy of the Renaissance was the great rejuvenator and originator in the realm of the intellect.

In more modern times the names of Corneille, Boileau, Voltaire, Diderot, Hugo, and Sainte-Beuve in France; of Kant, Schiller, and Lessing in Germany; of Sidney, Pope, Addison, Dryden, Wordsworth, and Shelley in England, represent differing views and opinions. Boileau's *Art poétique*, reminiscent of Horace's *Ars Poetica*, and Pope's *Essay on Criticism* have their distinct value as volumes of often authoritative formal instruction furnishing useful analyses of the different kinds of verse compositions. Of far more worth is Sir Philip Sidney's *Defence of Poesie* (an essay richly reminiscent of the Italian Renaissance), wherein he quaintly reminds us that "though the poet cometh to you with words set in delightful proportion," yet "it is not rhyming and versing that maketh a poet."

Lessing's great achievement was to disperse the fog that Corneille had raised around the dramatic principles of Aristotle, and by clarifying the classic doctrines, to make possible their application to all art under modern conditions. And here, without going into any details concerning any present-day doctrines, even though they be so interesting as the evolutionary theories with which we readily connect the name of M. Brunetière, it may be well to suggest the wider paths open to criticism through modern conditions. The Greek and Roman critics had only their own work to study. We of to-day have the dramas, the epics, the novels of many nations and ages. The study of comparative literature, now possible, opens up opportunities for tracing those influences which affected the literatures of all Europe, and affords the student the chance of building up from varying yet interrelated sources a standard of criticism. The differences due to national character and individual genius will teach him the limitations of hard and fast formal rules, while his faith in the fundamental canons of great art can only be made firmer by such comparative study. He will learn that criticism is of use as a method of judgment for the reader, rather than an inspiring guide to the poet, whose highest achievements are never the result of the rules whose vitality they attest. The critic who disregards the universal message of great art, and, maintaining that there is no disputing concerning taste, claims for his personal opinion as much value as can attach to any judgment, rejects for his impressionistic mess of pottage the birthright of many ages of culture. The subjective element of criticism is not, however, precluded by the positive laws revealed through the inductive method applied to works of art. As Lowell pointed out in his essay on *Don Quixote*, a book is great in proportion to what can be gotten from it, and many an artist has builded better than he knew. The individual critic can be so keen and yet true in his interpretations and so inspiring in his expression as to make his criticism itself creative literature. The qualities which are necessary to the ideal critic are, therefore, not alone knowledge of human nature and of the characteristics of the literature which has endured; he must himself have true power of intuition, sympathy combined with impartiality in judgment, a rational appreciation of the relative importance of form and content, the sense of beauty which will enable him to judge style, and the capacity for making others see what he sees. Method and technique are always valuable, and we of America have much reason to thank Child and Ticknor and Longfellow, who introduced scholarship into our country; for we must think of criticism first of all, not as a formidable and narrowing system, but indeed as a broad view-point, occupying the same relation to literature that literature holds to life; and as law is the condition of true liberty in life, so criticism is the bar to anarchy in literature. "We do not possess what we do not understand," said Goethe. The true critic, like the rhapsodist of old, can be the connecting link between the artist and the public, leading his readers to understand the beauty of a work, and so to possess it. The technical beauty may well be a matter of formal development, but the emotional beauty and appeal rest on the basis of the essen-

tial oneness of human nature, whether in the days of Athens, of Rome, of London, or of New York.

Criticism thus understood is freed from the charges to which certain critics have exposed it. It is not, on the side of form, a narrowing method of petty rules, but a rational study of fitting construction and adequate expression: on the side of content, its most lasting dicta are opposed to the contention of those who, like Ruskin, would make art a handmaiden of morality. It does not restrict genius, because genius precedes it, and genius connotes the sense of form and beauty, and can but be aided by reference to the simple laws of formal beauty. As the art of judgment concerning the fairest flowering of the human spirit, criticism has one of the highest of judicial functions; as the art of interpretation, admitting individual intuition and inspiring teaching, it has a creative function of wide and lofty worth. Consult: Aristotle, *Poetics*; Horace, *Ars Poetica*; Kames, *Elements of Criticism*, latest ed. (London, 1895); Gayley and Scott, *Introduction to the Methods and Materials of Literary Criticism* (Boston, 1899); Saintsbury, *History of Criticism* (London, 1900 et seq.); Courthope, *Life in Poetry, Law in Taste* (London, 1901); Woodberry, *A New Defence of Poetry* (New York, 1900).

CRITIQUE DE L'ÉCOLE DES FEMMES, krê'ték' de lá'kôl' dá fám (Fr., criticism of the school for wives). An amusing comedy by Molière, produced June 1, 1663, written in defense of his earlier comedy, *L'école des femmes*, which had been attacked by Le Visé, editor of *Le Mercure galant*, in the third series of his *Nouvelles nouvelles*. It consists of a discussion of the merits of the former piece, chiefly carried on between a hypercritical marquis and an amiable chevalier.

CRITIQUE OF PURE REASON (Ger. *Kritik der reinen Vernunft*). A great philosophical work by Immanuel Kant (1781), the basis of modern German philosophy.

CRITO (Lat., from Gk. Κρίτων, *Kritôn*). A wealthy friend and disciple of Socrates. He arranged for his master's escape from prison, but Socrates refused to take advantage of the plan. The philosophic dialogues which he is said to have written are now wholly lost. Plato's dialogue representing the last conversation between Socrates and Crito bears the latter's name.

CRITOLA'US (Lat., from Gk. Κριτόλαος, *Kritolaos*). A Greek philosopher, born at Phaselis, in Lycia, in the second century B.C. He succeeded Ariston of Ceos as the head of the Peripatetic School at Athens and acquired a high reputation as a philosopher and orator. About 155 B.C. he went to Rome, and, with Carneades and Diogenes, obtained a remission of the fine of 500 talents which the Romans had imposed upon Athens for the destruction of Oropus.

CRITTENDEN, GEORGE BIBB (1812-80). An American soldier, the son of J. J. Crittenden (q.v.). He was born at Russellville, Ky., graduated at the United States Military Academy in 1832, served with distinction in the Mexican War and was promoted to be lieutenant-colonel (1856). He resigned and joined the Confederate Army in 1861, was appointed major-general, and was placed in command of southeastern Kentucky and a part of Tennessee. For his defeat at Mill

Spring (1862), however, he was censured. He subsequently served as a volunteer, and from 1867 to 1871 was State Librarian of Kentucky.

CRITTENDEN, JOHN JORDAN (1787-1863). An American statesman, born near Versailles, Ky. He graduated at William and Mary College in 1807; served in the War of 1812; and was a United States Senator from 1817 to 1819; United States District Attorney from 1827 to 1829, and a United States Senator again from 1835 to 1841. In 1841 he was appointed Attorney-General by President Harrison, but resigned when Tyler became President, and was again in the Senate from 1842 to 1848, after which he was Governor of Kentucky from 1848 to 1850. He was again Attorney-General under President Fillmore, and in 1855 was a fourth time sent to the Senate. Although a Southerner, Crittenden consistently devoted his energy and eloquence to the preservation of the Union, and he exerted every effort, first, to avert the impending Civil War, and later to assist the Administration in its prosecution. In the Senate (1860-61) he urged unsuccessfully his famous compromise. (See CRITTENDEN COMPROMISE.) Retiring from the Senate in 1861, he served one term in the House, and in that body also strove for the supremacy of the Constitution. Consult *The Life of John J. Crittenden*, by his daughter, Mrs. Chapman Coleman (Philadelphia, 1871).

CRITTENDEN, THOMAS LEONIDAS (1815-93). An American soldier, the son of John Jordan Crittenden, born in Russellville, Ky. He was a private in the Kentucky Volunteers in 1836, studied law, and in 1842 became commonwealth's attorney. During the Mexican War he served as lieutenant-colonel under both General Taylor and General Scott, and when the former became President, was appointed United States consul at Liverpool. He entered the Federal Army at the beginning of the Civil War, became a brigadier-general of volunteers in October, 1861, and for gallantry at Shiloh, where he commanded a division, was raised to the rank of major-general (July 17, 1862). He afterwards commanded a division under General Buel, and took a prominent part in the battles of Murfreesboro and Chickamauga, but resigned from the service in December, 1864. He entered the regular army as colonel of the Thirty-second Infantry in 1866, was brevetted brigadier-general in 1867 for gallantry at Murfreesboro, and served on the frontier until his retirement in 1881.

CRITTENDEN COMPROMISE. In American history, a measure proposed in Congress in 1860 by Senator J. J. Crittenden (q.v.) as a means of preventing the secession of the Southern States, through the adoption of certain constitutional amendments. These amendments were five in number, and provided: (1) That the right to property in slaves was to be recognized and that slavery was to be permitted and protected in all the common territory south of 36° 30', and prohibited north of that line, while the land remained in its territorial status; (2) that Congress was not to have power to abolish slavery in the places under its exclusive jurisdiction which lay within a State where slavery existed; (3) that Congress was to have no power to abolish slavery in the District of Columbia so long as it existed in either Maryland or Virginia, and then only after the owners of the slaves had been compen-

sated; (4) that Congress was to have no power to prohibit or hinder the transportation of slaves from one State to another, or to a Territory where slavery was legal; (5) that Congress might provide that in cases where escaped slaves were rescued, or their arrest prevented by mobs, the owners should be compensated by the United States, which in turn might recover damages from the county in which the illegal act occurred. All of these amendments were to be permanent and 'unamendable.' The compromise was defeated in a committee of the Senate, and failed of consideration in the House.

CRIVELLI, krê-vê'lê, CARLO. A Venetian painter of the fifteenth century. His art was formed under the influence of the School of Padua, but he gradually developed a style of his own, and worked in several cities of the Roman Marches, especially at Ascoli, where he finally settled. His work, while somewhat angular and stiff, is characterized by tenderness and interesting richness of detail. He introduced agreeable landscape backgrounds and was particularly fond of giving fruits and flowers as accessories. Among his works are: "Madonna Enthroned," in the Cathedral at Ascoli; "Magdalen," in the Berlin Museum; "Madonna with Saints," "Crucifixion," and "Coronation of the Virgin," in the Brera Gallery at Milan.

CROAKER. See **DRUM**; **GRUNT**.

CROAKER AND CO. The pseudonym adopted by Joseph Rodman Drake and Fitz-Greene Halleck in the *Croaker Pieces*, in the *New York Evening Post* (1819).

CROAKER, Mr. and Mrs. An oddly assorted couple in Goldsmith's *The Good-natured Man*; she is as merry in her cynicism as he is lugubrious in his.

CROATAN, krô-â'tan. An island off the coast of North Carolina, south of Roanoke Island, at the time of the first English attempt at colonization, about 1585. By the shifting of the sands it is now probably a part of Hatteras or Ocracoke Island. A colony of 117 persons landed by Sir Walter Raleigh upon Roanoke Island in 1587, and of whose ultimate fate nothing definite was ever afterwards learned, is supposed to have taken refuge with friendly Indians upon Croatan Island, and to have eventually become absorbed into that tribe. Recently, new interest has been given to the story through the claim of descent from these colonists, asserted by a considerable body of mixed-blood stock in Robeson County, in the southern part of the State. Although their claim has probably no sound historical basis, they have been officially recognized by the State as a separate people under the name of 'Croatan Indians.'

CROATIA (krô-â'shî-â) AND **SLAVONIA** (Slav. *Hrvatska i Slavonija*, Hung. *Horvát-Slavonország*, from Croat, *Hrvat*, OChurch Slav. *Khrŭvatinŭ*, Slov. *Kurrat*, Pol. *Karwat*, Russ. *Khorvate*, Croat, and OChurch Slav. *Sloricieninŭ*, Russ. *Slavyaninŭ*, MGk. Ἑσκαλαβηνός, *Esclabēnos*, a Slav, whence Ger. *Sklave*, Engl. *slave*). A kingdom of Austria-Hungary, constituting one of the lands of the Hungarian Crown (Map: Hungary, D 4). It is separated by the Drave and the Danube from Hungary proper on the northeast, by the Save from Servia and Bosnia on the south, has Dalmatia and the Adriatic on the southwest, and Styria, Carniola, and Istria

on the west. Croatia constitutes the southwestern portion; Slavonia, the northeastern part. Its area is 16,770 square miles.

A large part of the surface consists of mountain chains ranging in height from about 2000 to 4000 feet, principally spurs of the Julian and Styrian Alps. In Croatia are the Agram highlands, the Croatian Karst (see **KARST**), with an elevation of about 500 feet, the two ranges of Great and Little Kapella, the former reaching a height of about 500 feet, and the Velebit range, whose highest summit is about 5750 feet. On the borders of Carniola are the Uskok Mountains. The beautiful mountain region on the northwest is called Croatian Switzerland. The interior part along the Save consists of an extensive and fruitful valley. The eastern part is interspersed with fertile, well-cultivated valleys, while the western part is covered with forests. There are several small rivers flowing into the Save and Drave, and a number of lakes on the coast.

The climate is generally moderate, but very raw in the coastland of Croatia, which is exposed to the currents from the Adriatic and to the fierce ravages of the Bora, a cold northeastern wind, very destructive in its effects and greatly feared by the inhabitants. In this western portion of the province the winters are long and the summers dry. In parts of Slavonia the climate is very insalubrious, on account of numerous swamps. The annual average temperature of the province fluctuates between 48° and 52° F. The soil is fairly fertile and the range of vegetation very wide. About 31 per cent. of the productive area is arable land, 25 per cent. is in meadows and pastures, and over 36 per cent. is under forests. The common European cereals are raised extensively, especially wheat and corn. The yield of potatoes is considerable. Fruits of different kinds are grown in abundance, notably apples, plums, nuts, and grapes in the southern part of the country. Hogs are raised in large numbers.

The mineral production of Croatia and Slavonia is unimportant. Some coal, iron, marble, copper, and sulphur figure in the exports. The manufacturing industries are only slightly developed. There are some silk-mills, glass and sugar mills, a few ship-building, milling, paper, and leather establishments in the coast districts, and a number of distilleries. The plum brandy of Slavonia is famous under the name of *Slivowitz*. There is a considerable transit trade, largely carried on through the ports of Fiume, Zengg, and Porto Ré. The chief articles of export are grain, fruits, wine, lumber, and flour. The province is well provided with railway facilities, and the two navigable watercourses of the Save and Danube contribute largely to its commercial importance. Much traffic is also carried on with Bosnia over the mountain roads.

The Ban, appointed by the Emperor, as King of Hungary, with the approval of the Hungarian Prime Minister, is at the head of the provincial administration. In its local administration the province is autonomous. It has a Diet (*Landtag*) composed of the Church dignitaries, magistrates, and representatives of the towns and rural communities, the last being elected indirectly. In the Hungarian Diet, the province is represented by forty Deputies in the Lower House and three in the Upper House. It is entitled to one min-

ister in the Hungarian Cabinet, who countersigns all important acts affecting the province. The finances are administered partly by the Hungarian and partly by the provincial Government. In 1900 the budget nearly balanced at 18,500,000 kronen. For administrative purposes the province is divided into eight counties. Very adequate facilities are provided for both elementary and secondary education. About 65 per cent. of the children attend schools. Agram (q.v.), the capital, offers excellent higher instruction. The population in 1900 was 2,397,249, as against 2,186,410 in 1890. About 89 per cent. of the people are Croats and Serbs, 3 per cent. Hungarians and 5 per cent. Germans. Seventy-one per cent. are Roman Catholics, 26 per cent. belong to the Greek Orthodox Church, and the rest to the Evangelical and other Reformed Churches.

HISTORY. Croatia and Slavonia were included in the Roman Province of Pannonia. The Croats are a southern Slavic people, speaking a language which differs but slightly from that of their neighbors the Serbs. They came down in the seventh century from the Carpathians and occupied Croatia and Slavonia. In the ninth century the Croats adopted Christianity of the Latin rite, separating them from the Serbs, who received Christianity from Constantinople. About the year 900, Croatia asserted its political independence of the Byzantine emperors, and, under its own king, extended its power over Bosnia and Dalmatia. A great part of Croatia was annexed to Hungary toward the close of the eleventh century, and in 1102 Koloman of Hungary had himself crowned King of Croatia and Dalmatia. The country was involved in the dynastic struggles and wars for self-preservation which were the lot of Hungary for centuries, and always maintained whatever position seemed favorable to its own nationality. In the Hungarian national rising of 1848, Jellachich, Ban of Croatia, was an active agent of the Austrian Imperial Government, which stirred him up to a campaign against the Hungarians. This action on the part of Croatia was a national movement as much as that of Hungary. The general principle of decentralization, as embodied in the *Ausgleich* of 1867 (q.v.), was partially applied to the relations of Croatia-Slavonia and Hungary by the compromise of 1868. A strong national party has continued to exist, cherishing the project of a greater and independent Croatia, to include all of the ancient kingdom, and joined to the Austrian Empire only by a personal union. Consult: Matkovič, *Kroatien und Slavonien nach seinen physischen und geistigen Verhältnissen* (Agram, 1873); Krauss, *Die vereinigten Königreiche Kroatien und Slavonien* (Vienna, 1889); Starč, "Die Kroaten im Königreiche Kroatien mit Slavonien," in *Die Völker Oesterreich-Ungarns*, 10, ii. (Vienna, 1882); Csaplovicz, *Slavonien und Kroatien* (Pest, 1819); De Worms, *The Austro-Hungarian Empire* (2d ed., London, 1877); De Laveleye, *The Balkan Peninsula* (London, 1887). See AUSTRIA-HUNGARY.

CROCE, krō'châ, GIULIO CESARE DELLA (1550-1620). An Italian author, born at Persiceto, near Bologna. He wrote a number of romances and plays, of which the principal is the always-popular *Bertoldo and Bertoldino*. This is probably an old folk-lore tale retold. It has been translated into many languages. The original titles of the two parts were: *Astutic sottilissime di Bertoldo*

(1620), and *Le piacevoli e ridicolose simplicità di Bertoldino figliuolo del già astuto e accorto Bertoldi* (1620).

CROCHET, krō-shâ' (Fr. *crochet*, hook, dim. of *croce*, hook, from Icel. *krókr*, hook, perhaps from Gael. *crocan*, Welsh *crwg*, hook, and connected with Lat. *crux*, cross). A form of fancy work where threads of linen, cotton, worsted, or silk are looped with hooks called *crochet-needles* to form various decorative and useful articles. Endless varieties of patterns may be formed, and lightness and elegance attained, by twisting the thread one or more times in taking up the loop, while openwork is formed by passing one or more loops.

CROCID'OLITE (from Gk. *κροκίς*, *crokís*, nap on cloth; connected with *κροκή*, *croké*, thread, from *κρέκειν*, *krekein*, to weave + *λίθος*, *lithos*, stone). A sodium iron silicate that occurs in fibrous or asbestos-like filaments, and also sometimes massive or earthy. It has a silky lustre, and in color varies from golden yellow to yellowish brown, indigo to greenish blue, light green, and dull red. The best specimens are found in Griqualand, in the Orange River country, South Africa. This mineral frequently contains a siliceous base, such as ferruginous quartz, and when cut *en cabochon*, with a high summit and the longer diameter of the oval at right angles to the direction of the fibres of which the mineral is made up, yields the cat's-eye ray, in consequence of which the mineral is popularly known as *tiger-eye*, and has some value as a gem stone, being used when polished for umbrella-handles, charms, etc. In the United States specimens are found in North Carolina, Pennsylvania, New York, and Rhode Island, but these are of no value for ornamental purposes.

CROCK'ER, FRANCIS BACON (1861—). An American electrical engineer. He was born in New York City, graduated at Columbia in 1882, and in 1889 was there appointed professor of electrical engineering. In 1892-95 he was president of the New York Electrical Society, and in 1897-98 of the American Institute of Electrical Engineers. He published *The Practical Management of Dynamos and Motors* (3d ed. 1894); and *Electric Lighting* (3d ed. 1899).

CROCKERY. See POTTERY.

CROCKET (from OF. *croquet*, variant of *crochet*, hook). A bit of ornamentation projecting alone and boldly from a plane surface, in Gothic architecture; usually in the form of a single heavy stem ending in leafage or flower, attached to a gable, pinnacle, bell of a capital, cornice, etc.

CROCK'ETT, DAVID (1786-1836). An American pioneer and politician, born in Tennessee. He was a typical backwoodsman, unlettered but shrewd, skillful as a hunter, and inordinately fond of an out-of-door life. He served under Jackson in the war against the Creek Indians, and in 1826, 1828, and 1832 was elected to Congress, where his oddities of dress attracted considerable attention and caused much comment. At the close of his third term he enlisted with the Texan forces, then in arms against Mexico, and in 1836 was one of the defenders of the Alamo (q.v.), where on March 6 he, with the rest of the garrison, was killed by Santa Anna's troops. Crockett's well-known maxim was: "Be sure you are right, then go ahead." He wrote

A Narrative of the Life of David Crockett (1834); *A Tour to the North and Down East* (1835); *Exploits and Adventures in Texas* (1836); and *Sketches and Eccentricities* (1847), all of which are characterized by crude wit, lack of grammar, and shrewd common sense.

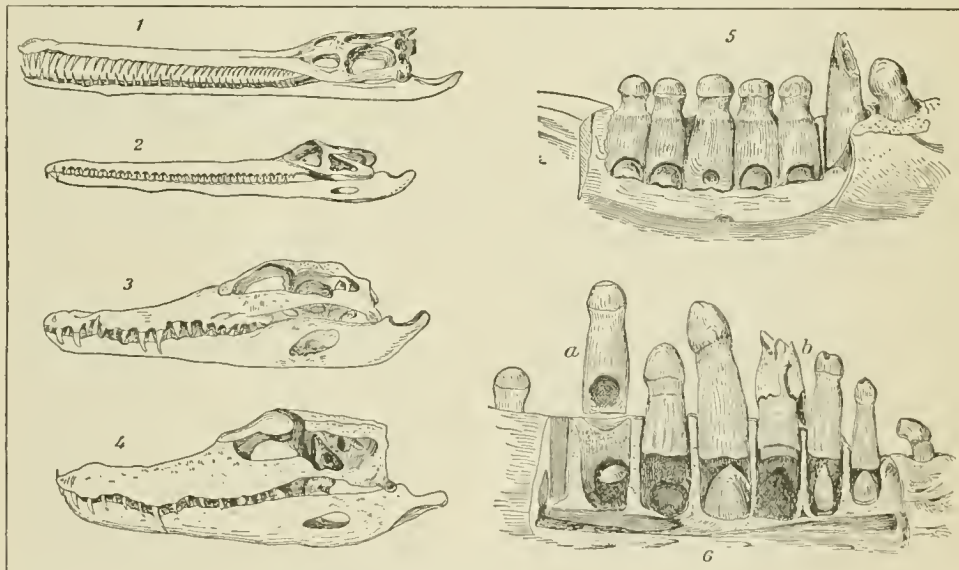
CROCKETT, SAMUEL RUTHERFORD (1860—). A Scotch novelist, born at Duchrae, New Galloway. He graduated at Edinburgh University in 1879, and for several years traveled in Europe, North Africa, and Asia. His first publication, *Dulce Cor*, a book of poems, appeared in 1886. He went to Penicuik in 1886, where he was a Free Church minister until the close of 1894, when he resigned his charge to devote himself wholly to literature. His most popular works are: *The Stickit Minister* (1893); *The Raiders* (1894); *Mad Sir Ughtred of the Hills* (1894); *The Lilac Sunbonnet* (1894); *The Play-Actress* (1894); *Boj-Myrtle and Peat* (1895); *The Grey Man* (1896); *Lad's Love* (1897); *The Standard Bearer* (1898); *The Black Douglas* (1899); *Kit Kennedy* (1899); *Joan of the Sword Hand* (1900); *The Dark o' the Moon* (1901); and *The Banner of Blue* (1902).

CROCODILE (Lat. *crocodilus*, Gk. κροκόδειλος, *krokodeilos*). An aquatic lacertiform carnivorous reptile, comparatively gigantic in size (several feet in length), representing the extensive subclass Crocodylia, regarded as the most highly organized of reptiles; more strictly one of the type-genus *Crocodylus*, of the family Croco-

the internal anatomy generally is much advanced. The heart has four distinct chambers, preventing an admixture of arterial and venous blood; and the organs of sense are well developed. Their limbs are of much more use to them in walking than are those of either turtles or newts, yet their real home is in the water, where they swim by means of twisting strokes of their compressed tails, which are also powerful weapons, and of aid in gaining food, since animals standing at the edge of a piece of water deep enough to permit a crocodile to swim close to the shore unobserved are frequently swept into the stream by a blow of the tail, then seized and drowned.

All crocodylians are oviparous. The eggs are about the size of those of a goose, and are buried in the sand or mud to be hatched by the heat of the sun alone. The females of some, if not all the species, guard them and take care of their young; yet the eggs and very young are preyed on by civets, a monitor-lizard, and many other enemies. In warm countries crocodiles bury themselves in mud in times of drought, and in cold countries during winter. They feed on fish, birds, and mammals, and many human beings lose their lives to them in certain regions. The necessity of taking small pieces of food, induced by their rigidly articulated jaws and unelastic throat, compels them to sink all their large prey and keep it until it is sufficiently macerated to be torn into small pieces.

All the species have a voice, described as a loud short bark or croak, heard at night, or when



SKULLS AND TEETH OF CROCODYLIANS.

1. *Teleosaurus* (extinct). 2. *Gavial*. 3. Nile crocodile. 4. American alligator. 5. Back part of the series of teeth of the lower jaw of an alligator, with the inner wall of the alveolar groove cut away, showing the absence of partitions and the germs of the successive teeth. 6. Middle part of the same series, showing the partitions, forming here distinct sockets from which the teeth are raised to show germs of successive teeth and dentiparous cavities; *a*, a tooth turned around to show the effect (a hole) of the new germ on its base; *b*, shell of an old tooth and two successors.

didide, typical of the order Eustachia. Crocodylians differ from lizards in many points of structure, and prominently in the horny plates within the thick skin which form a dorsal armor, and the firm setting of the strong teeth into alveoli, the fourth tooth often being much enlarged as a seizer. The skull has greater solidity and

the reptile is angry. The age to which they live is unknown, but they arrive at reproductive maturity when about ten years old, and seem to continue to grow for a century or more. Captives, and those often alarmed, show an ability to learn from experience.

"The recent geographical distribution of the

various kinds of Crocodilia loses its mystery," says Gadow, "when we recollect that during the Tertiary period alligators, crocodiles, and long-snouted gavials existed in Europe. The solitary species of alligator in China is the last living reminder of their former Periarctic distribution. The group, taken as a whole, is otherwise now intertropical, crocodiles alone inhabiting the Paleotropical region, together with long-snouted forms in the Oriental subregion, while alligators and caymans, with a few crocodiles, live in America."

The order Eustachia contains the crocodilians, ancient and modern. Two other (extinct) orders are recognized by Gadow (1902), both small and peculiar groups known only in late Mesozoic rocks. The genus *Etosaurus* represents the order Pseudosuchia, and *Belodon* the order Parasuchia. These and other Mesozoic crocodiles were marine, and seem to have been descended from some terrestrial dinosaurian stock. "So far as modern reptiles are concerned, only the Chelonia and *Sphenodon* are related to the Crocodilia, while monitors and other lizards resemble them only superficially."

The crocodilians (Eustachia) fall into seven families: (1) Teleosauridae, fossil in the Lias and Oolite of Europe; marine, and of the general appearance of gavials, with very long and slender snouts (see Figure 1). (2) Metriorhynchidae, fossil in the Upper Oolite of Europe; marine. (3) Macrorhynchidae, fossil in fresh-water deposits of Wealden, etc., of Europe. (4) Gavialidae, the gavials (see GAVIAL) fossil and recent. (5) Atopsauridae, fossil in the Upper Oolite of France; diminutive alligator-like reptiles only about a foot long. (6) Goniopholidae, large fossil crocodiles of the late Mesozoic. (7) Crocodilidae, true crocodiles and alligators.

Of the crocodiles proper (which are characterized by their narrow, elongated heads and much-webbed feet), the best and longest-known is the celebrated *Crocodilus vulgaris* of the Nile, which was revered, protected, and when dead embalmed by certain sects of the ancient Egyptians. Crocodile-worship, according to Flinders-Petrie, was indigenous, and one of the oldest worships of Egypt. It was most prevalent in Fayum, 'the Lake of the Crocodile,' whose marshy shores were especially favorable to that reptile, and which was the seat of the crocodile-god Sebek. Up the Nile, other places were devoted to this primitive worship, while at neighboring towns, such as Denderak, Apollinopolis, and Heracleopolis, it was detested. In the very earliest times the crocodile was regarded as a minister of vengeance, but not divine. Nowadays these animals are so much hunted that few remain in the lower Nile, but in its upper waters, and in other African rivers, crocodiles are still dangerously plentiful. The reptiles also abound in Madagascar; but the 'common' one on the West Coast, from Senegal to the Congo, is *Crocodilus cataphractus*. Two species inhabit the fresh waters and estuaries of India (see MUGGER), one ranging to Ceylon, and eastward to China, the Malay Islands, and Australia. A local species also inhabits northern Australia and Queensland. There are three crocodiles in North and South America and the West Indies. One (*Crocodilus Americanus*) ranges as far north as Florida.

The eggs of crocodiles are prized by some people as food, the musk-glands are taken for

perfume, and the skin and fat are articles of considerable commercial value.

Consult Gadow, *Amphibia and Reptiles* (London and New York, 1902); and authorities on Egypt, Central Africa, India, Ceylon, and Australasia. See ALLIGATOR.

Fossil Forms. Fossil ancestors of the crocodilians are known from rocks as old as those of the Triassic, and they are found throughout the later rocks of Jurassic, Cretaceous, and Tertiary time. The more primitive forms, comprising the totally extinct sub-order Parasuchia, are represented by *Belodon*, from the upper Keuper of Württemberg and the Triassic sandstones of North America; *Stagonolepis* of the Triassic of Scotland, and *Parasuchus* from the Gondwana series of central India. These three have long, narrow snouts, produced by the elongation of the premaxillary bones, and in the structure of their skulls they present some points of resemblance to the primitive dinosaurs and to the rhychocephalians. The Mesosuchia of Jurassic age, mostly reptiles of small size, have both long and short snouted forms, that differ from the Eusuchia in respect of the form of the palate, Eustachian tubes, and vertebrae. The principal genera are *Pelagosaurus*, *Metriorhynchus*, *Theriosuchus*, *Notosuchus*, *Teleosaurus*, *Stenosaurus*, from the Jurassic of Europe. The Eusuchia, also with both broad and long-snouted species, range from the Upper Jurassic through the Cretaceous and Tertiary, and comprise all the recent species, in which the Eustachian tubes are inclosed by bone and the vertebral centra are proœlous. Direct ancestors of the Malayan genus *Tomistoma* are found in the Miocene beds of the eastern Mediterranean region of south Europe. During the Eocene, typical gavials lived in the seas of England, but they migrated southward during subsequent Tertiary time, and their remains are found fossilized in the Pliocene deposits of the Siwalik Hills of India. The largest known crocodile was probably the genus *Rhamphosuchus*, from the Pliocene of the Siwalik Hills, India, with a length of over fifty feet.

BIBLIOGRAPHY. Parker, "On the Structure and Development of the Skull in the Crocodile," *Zoological Society of London Transactions* (London, 1885); Tornier, "Die Crocodile," *Beihft zum Archiv für Naturgeschichte* (Berlin, 1901). For fossil forms, consult: Dollo, "Première note sur les Crocodiliens de Bernissart," *Bulletin du Musée royal d'histoire naturelle de Belgique*, vol. ii. (Brussels, 1883); Woodward, *Outlines of Vertebrate Paleontology for Students of Zoology* (Cambridge, 1898); Huxley, "On *Stagonolepis* and the Evolution of the Crocodilia," *Quarterly Journal of the Geological Society of London*, vol. xxxi. (London, 1875); Woodward, "The History of Fossil Crocodiles," *Proceedings of the Geologists' Association*, vol. ix. (London, 1886). See also the articles on ALLIGATOR; GAVIAL; NOTOSUCHUS; PELAGOSAURUS; TELEOSAURUS; THERIOSUCHUS.

CROCODILE, Lady KITTY. A lady of fashion in Foote's *A Trip to Calais*, distinguished for her hypercritical dealings. The character was a satire directed against the Duchess of Kingston, who caused the withdrawal of the play.

CROCODILE-BIRD. A plover (*Pluvianus Egyptianus*) of the Nile Valley, sometimes placed among the coursers (genus *Cursorius*). It is remarkable for its association with the crocodile,

and now is usually identified with the *trochilus* or 'leech-eater' of Herodotus, whose account of it, long regarded as fabulous, is quoted by Stejneger as follows: "As the crocodile lives chiefly on the river, it has the inside of its mouth constantly covered with leeches; hence it happens that, while all other birds and beasts avoid it, with the trochilus it lives at peace, since it owes much to that bird, for the crocodile, when he leaves the water and comes out upon the land, is in the habit of lying with his mouth wide open, facing the western breeze; at such times the trochilus goes into his mouth and devours the leeches. This benefits the crocodile, who is pleased and takes care not to hurt the trochilus." Modern writers wholly denied this, but it is now known to be mainly true: that is to say, these birds do run about the bodies of crocodiles asleep or basking on the sand, in search of the insects or crustaceans clinging to their hides; and may at favorable moments pick parasites and particles of food from their lips, teeth, and gums. This has been actually seen by such good observers as Alfred Brehm and others, and has also been asserted of a related bird, the Egyptian lapwing. A very complete account of the evidence of this fact, and for identifying this species with the bird of the Herodotus tradition, will be found in Newton's *Dictionary of Birds* (London, 1894), article "Plover." The colors of this species are lavender and cream, strikingly marked with black on the crown and on the sides of the head, the black stripes joining and passing broadly along the back, and also extending down the sides of the breast. Consult: Shelly, *Birds of Egypt* (London, 1872); *The Field* (London, September 2, 1883). See Plate of PLOVERS.

CROCODILE RIVER. See LIMPOPO.

CROCODILE TEARS. Hypocritical, forced expressions of grief. This use of the term has sprung from the fiction of travelers that crocodiles shed tears over their prey. The conceit of *crocodiles' tears* (the animals have large lachrymal glands) was common in Shakespeare's time, and Spenser (*Faerie Queene*, i. 14-18) describes them.

CROCOITE (from Gk. *κροκόεις*, *krokocis*, saffron-colored, from *κρόκος*, *krokos*, saffron). A lead chromate. It crystallizes in the monoclinic system, has an adamantine to vitreous lustre, and occurs in various shades of bright red. It is found in crystals in quartz veins or in intersecting gneiss or granite, and is commonly associated with gold pyrite and other metallic ores. Crocoite occurs in the Urals, Hungary, Brazil, and with wulfenite in Maricopa County, Arizona.

CROCUS (Lat., from Gk. *κρόκος*, *krokos*, saffron). A genus of the natural order Iridaceæ. The species have much general similarity, and are natives chiefly of the south of Europe and of the East. They set seed, but since the seed-pods are under ground and are frequently overlooked, and since production of flowers from seed-sown plants is slow, they are chiefly propagated by their corms. Saffron prepared from the stamens of *Crocus sativus* is used medicinally and for dyeing; for the latter purpose, however, aniline colors are replacing it. Some of the species are much cultivated in gardens for the beauty of their flowers, particularly those which, as *Crocus vernus* and *Crocus imperati* and the Dutch hy-

brids of *Crocus asiaticus*, flower very early in the spring. The saffron crocus and some other species flower in autumn. The flowers of some species are fragrant. It is necessary frequently to take up crocus-roots and plant anew, on account of the manner in which the corms multiply—the new forming in some species above the old, thus, in time, raising the corm to or even above the surface of the ground. When planted in lawns the bulbs must be replaced every two or three years, because they soon become smothered by the grass. The autumn-flowering species are seldom cultivated in the United States. See Colored Plate with IRIS.

CROCUS OF ANTIMONY, or **CROCUS METALLORUM**. The bright-red antimony oxy-sulphide that is found native as *kermesite*.

CROCUS OF MARS, or **CROCUS MARTIS**. A polishing substance consisting of finely powdered ferric oxides.

CRÆSUS (Gk. *Κροῖσος*, *Kroisos*). A Lydian king of the Μερμανδᾶ line. The son of Alyattes, whom he succeeded, he flourished in the sixth century B.C. He came to the throne about the age of 35 (B.C. 560), and found the wrangling Æolians, Dorians, and Ionians an easy prey, but he did not press his advantage as conqueror beyond the exaction of tribute. Save Lycia and Cilicia, all Asia Minor west of the Halys fell before him. His ability in practical affairs soon made him the richest of monarchs, and 'rich as Cræsus' was a hyperbole formerly more apt than in our day of fabulous wealth. His capital, Sardis, became the brilliant centre of arts and letters, and Cræsus was a munificent patron. The great-souled law-giver of the Greeks was one of his visitors, Herodotus informs us, and when questioned by the King whether the possessor of so great riches might not be deemed the happiest of men, Solon replied in a frank philosophy, the value of which could not then be appreciated. When the long peace of the kingdom was evidently about to be disturbed by the encroaching Persians, Cræsus formed a league with the Lacedæmonians. He sought to propitiate the gods by bestowing rich gifts upon Apollo's shrine, and, encouraged by the oracle's deliverance that he "would destroy a great empire," he determined to take the offensive. With his Lydian forces only, he joined battle with the enemy, but achieved no advantage, a failure which he attributed to the inadequate support of his mercenaries. Returning to Sardis, he called upon the Lacedæmonians for their promised aid, and invited the assistance of the Egyptian King, Amasis, meaning to renew the contest early in the next year. For this Cyrus did not choose to wait, but decided upon immediate action. Cræsus, almost totally unprepared, met a certain defeat at Thymbra, and, after a short siege of Sardis, surrendered his capital. After a reign of fourteen years he gave up his crown to the Persian. The oracle spoke truth—he destroyed a great empire, but it was his own. Herodotus further relates that as the Lydian awaited the fire which, by command of Cyrus, was to consume him, he remembered his conversation with the Athenian philosopher, and called out "Solon, Solon, Solon!" Desiring to know the reason of the exclamation, Cyrus heard the story, and straightway commanded that the victim be spared. But Apollo's intercession was required

to save him from the flames now raging about him. A merciful rain fell, and Cresus, given a residence near Ebatana, was taken into his conqueror's favor, and later into that of Cambyses. To both monarchs he is said to have rendered valuable service as a counselor, and both he survived. Just what his end was is not known.

CROF'FUT, WILLIAM AUGUSTUS (1836—). An American journalist and author, born at Redding, Conn. During the Civil War he was first a soldier and then a correspondent in the field for the *New York Tribune*. Afterwards he became editorially connected with various journals, and was executive officer of the United States Geological Survey, whose publications he edited for some time. He is the author of *The War History of Connecticut* (1867); *A Helping Hand for American Homes* (1868); *A Midsummer Lark* (1882); *The Vanderbilts* (1886); *Folks Next Door* (1892); *The Prophecy and Other Poems* (1893); a volume of poems, *Bourbon Ballads* (1880); the opening ode for the World's Columbian Exhibition (1893); and *Deseret*, the libretto for the opera by Dudley Buck.

CROFT (AS., small field). A piece of land connected with a humble kind of dwelling, whose inhabitant, the renter of the land, is called a 'crofter,' and this method of letting small pieces of land, either for tillage or the rearing of cattle, is known as 'the crofting system.' This kind of petty farming was formerly common in Scotland, more particularly in the Highlands.

CROFT, króft, Sir HERBERT (1751-1816). An English writer. He was educated at University College, Oxford; took orders, and was appointed to the living of Prittlewell, in Essex, which he retained till his death, passing, however, much of his time abroad. He wrote extensively, but is mainly remembered by his *Life* of the poet Young, which he contributed to Johnson's *Lives of the Poets* (1779-81). He succeeded capably in imitating Johnson's style. A novel in letter form called *Love and Madness* (1780) became notorious on account of the insertion of certain letters of Chatterton obtained under false pretense.

CROFT, or **CROFTS**, WILLIAM (1678-1727). An English musician. He was born at Nether Easington, Warwickshire, and studied music in the choir of the Royal Chapel, then under the direction of Dr. John Blow. He was organist of Saint Anne's, Westminster, from 1700 to 1711. In 1707 he was also appointed organist at the Chapel Royal, and it was in this capacity that he produced the beautiful anthems which have perpetuated his fame. In 1724 he published his *Musica Sacra* (2 vols.), containing a collection of thirty anthems and a burial service. According to the preface of the composer, this was the first attempt made in England to print the score of a sacred composition from engravings on plates. Among the best anthems of Dr. Croft are the following: *I Will Give Thanks* (1704), for the thanksgiving after the battle of Blenheim; *The Soul of the Righteous* (1714), for Queen Anne's funeral; *The Lord is a Sun and Shield* (1714), for the coronation of George I.; *O Give Thanks* (1715), for the suppression of the rebellion.

CROFT'ANGRY, CRYSTAL. The imaginary editor of Scott's *Chronicles of the Canongate*.

He is said to have been intended for Scott's father.

CROFTER. A term designating a class of small tenants of the Scottish Highlands and islands who hold arable land in severalty, and usually certain rights of pasture in common. The crofter is for the most part a descendant of the lowest class under the early clan system; and the rights of common pasturage are traceable to the communal proprietorship of the clan. After the breaking up of the clans, the legal status of the crofter became that of a tenant at will; by custom, however, he was usually accorded certain fixity of tenure.

During the first half of the eighteenth century the chieftain of the clan, while losing his political leadership, came to be regarded as the proprietor of the soil. In some districts the chieftains who had been at war with the royal power were displaced, and the land granted to supporters of the King. In either case the followers of the chieftain became tenants, owing rent for their land instead of personal services and dues, as formerly. Nevertheless, their economic position was fairly satisfactory, especially in the islands. But with the expansion of the woolen industry it became profitable for the landlord to turn his estate into sheep-runs; accordingly, wholesale evictions of the crofters took place in many of the Highland districts. Moreover, natural increase of population had necessitated a reduction in the size of the individual holdings; so that at the end of the eighteenth century the whole class of crofters had been reduced to a condition of abject poverty. In the early part of the nineteenth century emigration of the crofters to America and the British colonies was officially encouraged; work-houses were established and extensive measures for relief in time of famine were undertaken; but no permanent improvement was thus secured. In 1883 a Parliamentary commission was appointed to investigate the conditions of life of the crofters. As a result of the investigation, the Crofters' Act of 1886 was passed. By this act the crofter is granted permanence of tenure, so long as he does not violate the specified conditions of his tenure; rents are fixed by a commission; compensation is allowed for improvements which the tenant may make, and the tenant has a right to demand the assistance of the landlord in making other permanent improvements. In order to remedy the evil effects of the excessive subdivision of holdings, the crofter is empowered to call upon the landlord to rent him additional land when the original holding is deemed by the commission to be insufficient.

Since the passage of this act the position of the crofter has materially improved. Rents have been lowered; and the crofter, assured that improvements which he may make will not have the effect of raising his rents, and will not be taken from him through eviction, has advanced appreciably in methods of agriculture and industry.

Consult: Dalriad, *The Crofter in History* (Edinburgh, 1888); Guemier, *Les crofters écossais* (Paris, 1897).

CROFTS, krófts, ERNEST (1847—). An English painter, born at Leeds. He studied under A. B. Clay in London, where he afterwards came to live, and with E. J. Huxton in Düsseldorf. Among his chief works are "Cromwell at Marston Moor" (1877); "At the Farm of Mont

Saint Jean, Waterloo" (1882); and "Marlborough at Ramillies." All these are distinguished for accuracy and truth of detail, but the action with which a French painter would have managed such scenes is lacking. They are primarily historical studies rather than works of art. However, Crofts stands among the first of the few English battle-painters. He was made a Royal Academician in 1896.

CROGHAN, krō'gan, GEORGE (1791-1849). An American soldier, born near Louisville, Ky. He graduated at William and Mary College in 1810, entered the army in 1812, distinguished himself under General Harrison at Fort Meigs, and on August 1-2, 1813, defended Fort Stephenson (on the present site of Fremont, Ohio) against the attack of a greatly superior force of British and Indians, for which he received the thanks of Congress and a gold medal. In 1814 he was promoted to be lieutenant-colonel, but resigned in 1817 and was appointed postmaster at New Orleans in 1824. He became inspector-general with the rank of colonel in 1825, joined General Taylor's forces in Mexico in 1846, and took a prominent part in the battle of Monterey.

CROISSET, krwā'zā', MARIE JOSEPH ALFRED (1845—). A French classical philologist, born in Paris. He was appointed professor of Greek at the Faculté des Lettres in 1885 and became a member of the Academy of Inscriptions in the following year. He is the editor of various Greek authors, and the author of *De Personis apud Aristophanem* (1873); *Xénophon, son caractère et son talent* (1873); *La poésie de Pindare et les lois du lyrisme grec* (1880); and, in conjunction with Maurice Croiset, *Histoire de la littérature grecque* (1887-99).

CROISSET, MAURICE (1846—). A French classical philologist, brother of the preceding, born in Paris. He became professor of the Greek language and literature at Montpellier in 1876, and professor of the Greek language and literature at the Collège de France in 1893. He is the author of *De Publicæ Eloquentiæ Principiis apud Græcos in Homericis Carminibus* (1874); *Des idées morales dans l'économie politique de Démosthène* (1874); *Essai sur la vie et sur les œuvres de Lucien* (1882); and, in conjunction with Alfred Croiset, *Histoire de la littérature grecque* (1887-99).

CROIX, krwā, CARLOS FRANCISCO, Marqués de (1699-1786). A Spanish general and administrator. He was born at Lille, French Flanders, and after serving in the Spanish Army was appointed commandant at Ceuta, whence he was transferred in the same capacity to Puerto de Santa María. He afterwards became Captain-General of Galicia, and was Viceroy of New Spain (Mexico) from 1766 to 1771. He was distinguished by strict integrity and high administrative ability. During the last fifteen years of his life he was Viceroy and Captain-General of Valencia.

CROIX, TEODORO DE (c.1730-91). A Spanish soldier. He was born at Lille, French Flanders, and was a brother of the Viceroy of New Spain, who appointed him Governor of the interior provinces of the country and of Sonora. During his brief term as Viceroy of Peru (1784-90) he did much to ameliorate the condition of the Indians and enacted several laws for their pro-

tection. He died soon after his return to Madrid.

CROIZETTE, krwā'zēt', SOPHIE (1847-1901). A French actress. She was born in Saint Petersburg. After two years at the Conservatory she obtained the first prize for comedy. In 1869 she appeared at the Théâtre Français as Queen Anne in *Un verre d'eau*, and four years afterwards was made a 'sociétaire.' Mlle. Croizette rarely appeared in classic rôles. Her best work was in the *Sphinx* (Octave Feuillet), *L'étrangère* (Dumas fils), *Fourchambault* (Emile Augier), and *La princesse de Bagdad* (Dumas fils), her last and greatest creation. She retired from the stage at the height of her success, in 1885.

CROKER, B. M. An English novelist. She was a daughter of William Sheppard, rector of Kilgefin, Roscommon, Ireland; was educated in England; married John Croker, of the Royal Munster Fusiliers, and traveled extensively in India and other parts of the East. Mrs. Croker has written some good Irish peasant stories, as *Terence* (1899), and excels in depicting Anglo-Indian life, particularly the fashionable feminine world. The scenes of *Jason and Other Stories* (1899), comedy running into farce, are laid in India, Australia, and England. Her novels are commonly translated into French and German. Besides those above, may be cited *Proper Pride* (1882); *Pretty Miss Neville* (1883); *Diana Barrington* (1888); *Mr. Jervis* (1894); *Village Tales and Jungle Tragedies* (1894); *In the Kingdom of Kerry* (1896); *Beyond the Pale* (1897); *A State Secret* (1901); *Angel* (1901).

CROKER, JOHN WILSON (1780-1857). An English writer and politician. He was born at Galway, Ireland. Educated at Trinity College, Dublin, he entered Lincoln's Inn as a student in 1800, and two years later was called to the Irish bar. In 1804 he published *Familiar Epistles*, a clever satire in verse on the Irish stage, and *An Intercepted Letter from Canton*, a satire in prose on Dublin society. Both ran through several editions. In 1808 he issued a treatise on the *State of Ireland, Past and Present*—a pamphlet on Catholic emancipation—which brought him to the notice of politicians, and in the same year he was elected member of Parliament for Downpatrick. A warm defense in Parliament, in 1809, of the Duke of York, charged with corrupt administration, helped Croker in the same year to the office of Secretary to the Admiralty, a post which he held for more than twenty years. He was one of the founders of the *Quarterly Review*, and contributed many violent party articles to its pages, as well as a large number of personal and abusive reviews, one of the most famous being on Keats's *Endymion*. As Rigby he was caricatured by Disraeli in *Coningsby*. In Parliament he steadily opposed the Reform Bill in all its stages, and after its enactment he refused to enter Parliament again. He took an active part in the establishment of the Athenæum Club, and rendered good service to literature by his annotated edition of Boswell's *Johnson* (1831), famous for Macaulay's savage review of it, and by his publication of the *Suffolk Papers* (1823) and Lord Bervey's *Memoirs of the Court of George II.* (1848). His *Stories from the History of England for Children* (1817) supplied

Scott with the idea of *Tales of a Grandfather*. He also continued for a time to write verse. His *Battle of Talavera* (1809) pleased Wellington and was praised by Scott. Consult *Jennings, Diaries and Correspondence of Croker* (London, 1884).

CROKER, RICHARD (1843—). An American politician, well known as a leader of Tammany Hall in New York City. He was born at Black Rock, Ireland, but when two years of age was brought by his parents to America, and for a short time attended the public schools in New York City. He was then for seven years employed as a machinist, became prominent in the New York volunteer fire department, and took an active interest in local politics, and about 1865 identified himself with the Tammany Hall organization. From 1868 to 1870 he served as an alderman; was reelected in 1872, but was forced out of office by Tweed, and acted for several months, on Mayor Havemeyer's appointment, as city marshal, his special duty being the collection of arrears in taxes. He was elected city coroner in 1873, and again in 1876, was appointed fire commissioner in 1883 and was reappointed to that position by Mayor Abram S. Hewitt in 1887. During this time his influence in Tammany Hall had gradually increased, and in 1886, on the death of John Kelly (q.v.), he became chairman of the Finance Committee of that organization and its recognized leader. From April, 1889, to February, 1890, he was City Chamberlain. He conducted the successful mayoralty campaigns of Hugh Grant, Thomas F. Gilroy, and Robert A. Van Wyck in 1889, 1893, and 1897 respectively, and during the Presidential campaign of 1900 was conspicuous as a supporter of the Democratic candidate, W. J. Bryan. In 1902, soon after the election of Seth Low to the mayoralty of New York, he resigned his position as leader of Tammany Hall.

CROKER, THOMAS CROFTON (1798-1854). An Irish author and antiquarian. He was born in Cork, January 15, 1798. He early devoted himself to the collection of legends and songs of the Irish peasantry; and in 1824 he published his *Researches in the South of Ireland*, characterized by a happy blending of humor and sentiment with archæological learning. The work was followed by the *Fairy Legends and Traditions of the South of Ireland* (1825); *Legends of the Lakes* (1829); and *Popular Songs of Ireland* (1839). Croker also edited *Memoirs of Joseph Holt, General of the Irish Rebels*, wrote two novels, and contributed to the magazines. He devoted much time to archæology, being member of many antiquarian societies. Through the influence of John Wilson Croker, a friend, but no relative, he obtained at the age of twenty-one a clerkship in the Admiralty, a position which he held till 1850. He died August 8, 1854. Consult *Life*, by his son, prefixed to *Fairy Legends* (London, 1859). The *Popular Songs* were edited by Morley (London, 1886).

CROLL, KRÖL, JAMES (1821-90). A Scotch geologist. He was born at Whitefield, Perthshire, and received only the usual brief schooling of a peasant's son. He studied philosophy and physical science, and published a treatise on the *Physical Cause of the Change of Climate During the Glacial Period* (1864). He was appointed an officer of the geological survey of Scotland,

and in that post (1867-81) prosecuted researches which resulted in works including the treatise on *Climate and Time in Their Geological Relations* (1875), in which he ascribed climatic changes during geological epochs to secular variations in the eccentricity of the earth's orbit; and *Climate and Cosmology* (1886), containing a discussion of the origin of the sun's heat and the probable development of the nebulae and stars. Though considerable difference of opinion exists as to the real value of these views in relation to the establishment of a sound geological theory, there is general recognition of the value of his works as stimulating and directing inquiry. In his later life he returned to the field of philosophical speculation and published *The Philosophie Basis of Evolution* (1890), in which he discusses the fundamental principles underlying the doctrine of evolution.

CROLY, DAVID GOODMAN (1829-89). An American journalist, born in New York and educated at the New York University. He was associated with the *Evening Post* and the *New York Herald* (1854-58), and then became city editor and subsequently managing editor of the *New York World*. From 1872 to 1878 he was editor of the *Daily Graphic*. His published works include *Scymour and Blair: Their Lives and Services*, with an appendix containing a *History of Reconstruction* (1868).

CROLY, GEORGE (1780-1860). An Irish author and clergyman. He was born in Dublin and was educated at Trinity College there. In 1810 he was ordained a priest of the English Church, and in 1845 became rector of Saint Stephen's, Walbrook, London. His first work was a poem, entitled *Paris in 1815*, which appeared in 1817. From this time up to within a short period from his death he wrote almost incessantly as dramatic critic of the *New Times*, as a contributor to *Blackwood's* and the *Literary Gazette*, and as the author of numerous satires, romances, and biographies. Among his works are: *The Angel of the World* (1820); *Tales of Saint Bernard* (1829); the novel *Marston* (1846); and the poem *The Modern Orlando* (1846). He was an imitator of the grandiose style of Byron and Moore, yet *Salathiel* (1829), his chief publication, contains many effective scenes and is still good reading. It was reprinted in New York in 1901 as *Tarry Thou till I Come*.

CROLY, JANE CUNNINGHAM (1831-1901). An American author and journalist, better known as JENNIE JUNE. She was born in England, came to the United States when a girl, and at an early age became a contributor to newspapers and magazines. She called the first congresses of women in the United States in 1856 and 1869; organized Sorosis in 1868; founded the New York Women's Press Club (of which she was later president), in 1889; and in 1892 became professor of journalism and literature in the Rutgers Women's College, which institution conferred upon her the degree of L.H.D. She was married to David G. Croly in 1856. Her works include: *For Better or Worse* (1875); *Jennie Juneiana*; *Talks on Women's Topics* (1864); *Thrown on Her Own Resources*; *Cookery-Book for Young Housekeepers* (1866); *Knitting and Crochet*; and a *History of the Woman's-Club Movement in America*. She was editor of *Demorest's Magazine*

from 1860 to 1887, and later was editor of the *Cycle* (which she founded) and the *Home-Maker*.

CRO-MAGNON, *kró'má'nyōn'*. A type of mankind supposed to have inhabited southwestern Europe at the end of the Magdalenian epoch, at the close of the Pleistocene. They were marked by the most dolichocephalic of crania, elongated at the back (index 63-74.8), with low face and orbits, but by good stature. In 1858 workmen unearthed, in the cave called Cro-Magnon, near Les Eyzies, in the Department of Dordogne, France, imperfect skeletons of three men, two women, and a child. A peasant found a human bone in a rabbit-hole, and at the Cave of Aurignac the remains of seventeen persons were recovered. At Laugerie Basse, in the Vézère Valley, another discovery was made. In the Cave of Baumes Chaudes, in Lozère, thirty-five crania were collected, all of this long, low-faced type. At other places the same marks have been noted, both on the dead and on the living, in Africa and in Europe. To this type, wherever found, the name of Cro-Magnon is given. Consult: Mortillet, *Le préhistorique* (Paris, 1882); Deniker, *Races of Man* (London, 1900); Ripley, *The Races of Europe* (New York, 1899); and, for critical observations, Sergi, *The Mediterranean Race* (London, 1901).

CROMARTY FIRTH, *króm'ēr-tī fērth* (from Gael. *crom*, OIr. *cromb*, Welsh, *crom*, Bret. *crom*, crooked + OIr. *art*, Gall. *artos*, stone, and *firth*, *frith*, from Icel. *fjörðr*, ford; ultimately connected with Lat. *portus*, port, Skt. *par*, to cross). A landlocked inlet of the North Sea, on the northeast coast of Scotland, just northwest of the Moray Firth, 18 miles long, 3 to 5 miles broad, and 5 to 35 fathoms deep (Map: Scotland, D 2). The entrance is between the North and South Soutars, two high wooded headlands, and is 1½ miles across, with 12 to 30 fathoms of water, and with the Three Kings Reef about half a mile off land. Near the firth are the towns of Dingwall, Invergordon, and Cromarty. In the red sandstone, near the entrance, Hugh Miller discovered the fossil fishes *Pterichthys*, *Osteolepis*, etc.

CROMARTYSHIRE. See ROSS AND CROMARTY.

CROM'DALE (from Gael. *crom*, crooked + Engl. *dale*). A village in Inverness-shire, Scotland, on the eastern bank of the Spey, scene of a battle fought May 1, 1690, between the Scotch Jacobites and 800 of William III.'s troops, in which the latter were victorious (Map: Scotland, E 2). The event is celebrated in a song entitled, "The Haughs of Cromdale."

CROME, JOHN (1768-1821). An English landscape painter, founder of the Norwich school. He is usually called Old Crome, to distinguish him from his son of the same name. Born on December 22, 1768, he passed his youth in humble circumstances, acquiring his taste for painting during an apprenticeship to a sign-painter. Together with Robert Ladbrook, a printer's apprentice, he rented a garret and started upon his career as a painter. The two artists spent their leisure time sketching in the field, endeavoring to reproduce nature exactly. Crome's pictures thus became 'exact views' of the places he loved. His technique is that of the Dutch masters, whom he studied in the houses of the Norfolk gentry, in his capacity as a drawing

teacher, and in a visit to Paris. Hobbema, in especial, was his favorite master. Crome's pictures contained the usual brown tone of the Dutch school, and although they are occasionally marred by over-attention to detail, they always contain a true feeling for light and air. He painted trees with great force and individuality. His "Oak at Poringlam" and the "Willow" are highest masterpieces of their kind. His works are mostly in private possession, especially among the gentry of Norfolk. The National Gallery contains two good examples, "Mousehold Heath" and "Chapel Fields, Norwich." His favorite subjects were taken from the scenery about his native home, but he was capable of adapting himself to the livelier tones of French landscape, as is indicated in his "Fishmarket at Boulogne" and his "Boulevard des Italiens, Paris." Although he followed etching as a pastime only, he was an excellent etcher, working with great care and detail, though sometimes not achieving tone and atmosphere. His etchings were published after his death, in 1834, under the title of *Norfolk Picturesque Scenery*, and again in 1838 and 1850. Crome seldom exhibited in London, but he displayed at different times no less than 288 pictures in the Norfolk Society of Artists. This society he himself founded in 1803, becoming its president in 1808. He died April 22, 1821, at Norwich, where nearly all of his life had been passed.

CROME, JOHN BARNEY (1794-1842). An English painter, son and pupil of John Crome, usually called Young Crome. His pictures are distinguished for merit, the best resembling those of his father. Consult: Heaton, "Life of John Crome," in the appendix to Cunningham's *Lives of the British Painters* (London, 1882); Wodderspoon, *John Crome and His Work* (Norwich, 1850).

CROMER. A seaport and watering-place on the north coast of Norfolk, England, 21 miles north of Norwich (Map: England, H 4). It stands on the top of one of the highest cliffs on the coast. Nearly all the old town, called Shipden, with one of the churches, was swept away by the sea about the year 1500. The sea is gaining on the land, and vessels have to load and unload on the open beach. In 1825 some cliffs 200 feet high fell into the sea. Seamen call Cromer Bay the Devil's Throat, from its dangers to navigation. Population, in 1891, 2500; in 1901, 3800.

CROMER, EVELYN BARING, first Earl (1841—). An English diplomatist and administrator, born at Cromer Hall, Norfolk, and educated at Woolwich Academy. After a brilliant career in the Royal Artillery, he served as private secretary to the Earl of Northbrook, Governor-General of India, from 1872 to 1876; was Commissioner on the Egyptian public debt from 1877 to 1879; was Controller-General of Egyptian finances from 1879 to 1880; and was Finance Minister of India from 1880 to 1883, when he became Consul-General and Minister Plenipotentiary in Egypt, which positions he still held in 1902. He was created first Baron Cromer in 1892, first Viscount in 1899, and Earl in 1901. He became virtually British Viceroy of Egypt, and his efficient administration won for him the appellation of 'Maker of Modern Egypt.' He rescued it from bankruptcy; re-

placed corrupt administrators by honest officials; reduced taxes; reformed the army; increased trade, and greatly extended railway, postal, and telegraph facilities.

CROMER, MARTIN (1512-89). A Polish historian, born at Biecz, near Cracow, and educated at the academy in that city. He was secretary to the eldest son of King Sigismund I., and was intrusted with diplomatic missions to Pope Paul V. and to the emperors Charles V. and Ferdinand I. In 1578 he was appointed bishop of Ermeland. His history of Poland, from its beginning to the year 1506, *De Origine et Rebus Gestis Polonorum* (1555; frequently reprinted), is a valuable source of information on this subject. Another important work is the geographical and statistical publication *Polonia* (in Latin, 1586; German trans. 1741).

CROMLECH, króm'lek. See **DOLMEN**.

CROMPTON. A town in Lancashire, England, four miles northeast of Oldham, and eleven miles northeast of Manchester. It has important cotton manufactures. Population, in 1901, 13,400.

CROMPTON, SAMUEL (1753-1827). An English inventor, whose spinning-mule revolutionized the cotton-weaving industry. In his youth he was largely occupied with weaving at home, and it was the dissatisfaction caused by the machine he used that led to the perfection of his invention in 1779. Unable to bear the expense of taking out a patent, he exploited his machine by private arrangement with manufacturers, some of whom later denied their obligations to him; so that for his valuable invention he received less than £70. In 1812, after much labor, he secured from the House of Commons a grant of £5000, the only official recognition bestowed upon him. Consult French, *Life and Times of Crompton* (London, 1860).

CROMPTON'S SPINNER. See **SPINNING**.

CROMWELL. A dramatic work by Victor Hugo (1827). It was not intended for the stage. The preface to its first edition has since become famous as containing the breviary of French dramatic 'Romanticism.'

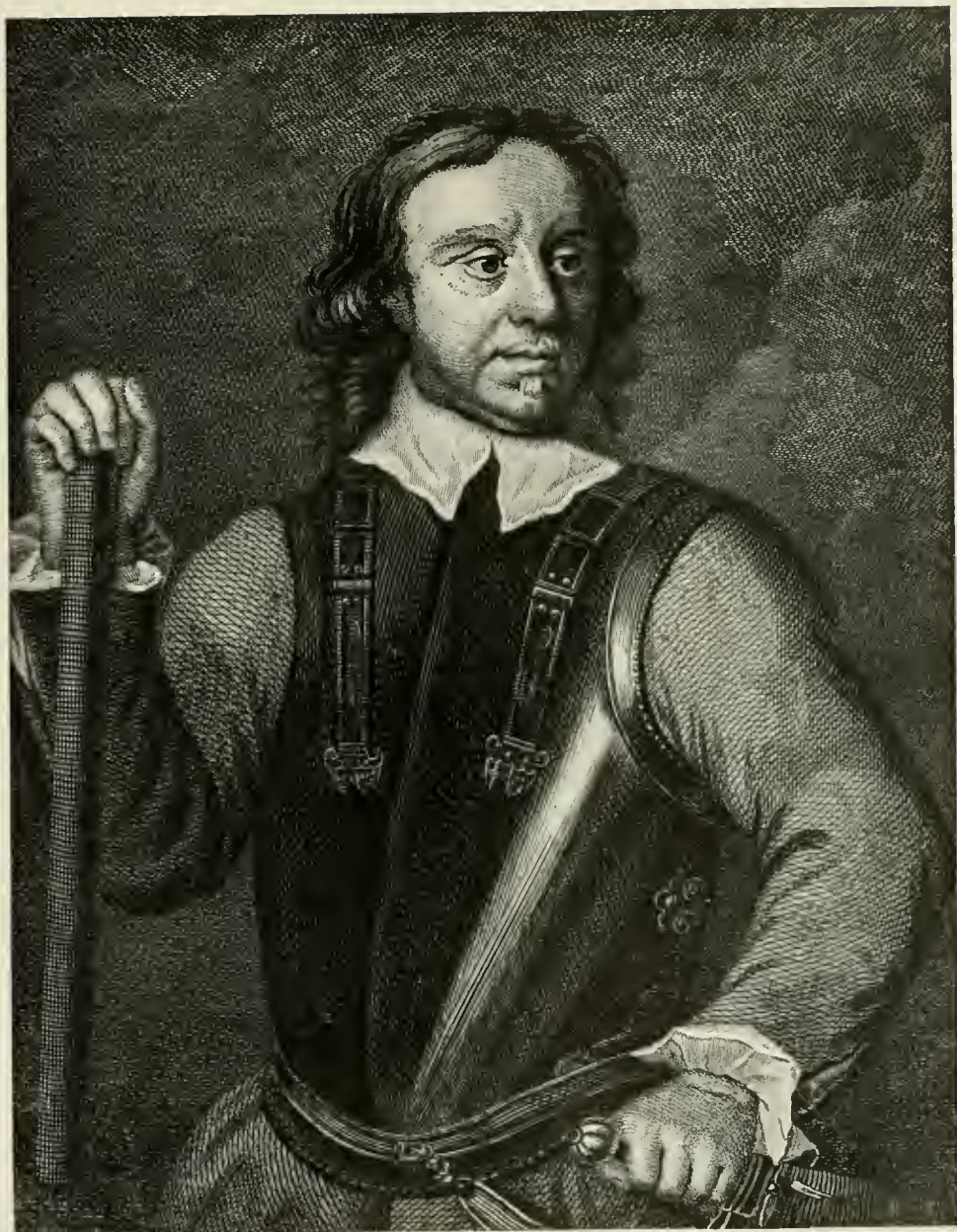
CROMWELL, BARTLETT (1840—). An American naval officer, born in Nebraska. He attended the Naval Academy for three years (1857-60). During the Civil War he served in the South Atlantic blockading and Eastern Gulf squadrons, and rose to the rank of lieutenant-commander. He was promoted commander in 1874, and as such was intrusted with the navigation of the flag-ship *Ticonderoga* during Admiral Schufeldt's voyage around the world in 1879-81. He thereafter successively became captain in 1889, commodore in 1898, and rear-admiral in 1899. After the liberation of Cuba from Spain, Cromwell was ordered to take charge of the naval station at Havana. In 1901 he was appointed to the command of the United States fleet in South American waters.

CROMWELL, HENRY (1628-74). The fourth son of Oliver Cromwell. At the age of sixteen he served as a soldier in the Parliamentary army. In the Barebones Parliament he was one of the six Irish members. In 1655 he went to Ireland as a major-general, and was appointed Lord Lieutenant in 1657. His rule was popular, and his moderation to Royalists received the approval of Charles II., who, at the Restoration, confirmed

his Irish estates under the Act of Settlement. His latter years were passed as a farmer. His great-grandson, the last representative of the house of Cromwell, died in 1821.

CROMWELL, OLIVER (1599-1658). Lord Protector of England. He was born at Huntingdon, April 25, 1599, and was the only surviving son and heir of Robert Cromwell and Elizabeth, daughter of William Steward, whose family, tradition notwithstanding, has no connection with the royal house of Stuart. The Cromwell family sprang from Katherine, who was the sister of Thomas Cromwell, the Hammer of the Monks, and who married Morgan Williams, a Welsh brewer of means. Their son Richard took the surname Cromwell, and, profiting by his uncle's influence, rose to wealth and honor in the service of Henry VIII., retaining his sovereign's favor even after his uncle's fall in 1540. The family continued to be prominent from that time, and was noted for its lavish entertainment of royalty, but owing to the extravagance of Oliver's uncle of the same name, the fortunes of the family had been squandered, and in 1627 the family seat at Hinchinbrook was sold to Sir Sidney Montague. Oliver's father was the second son of Henry, the Golden Knight, and the grandson of Richard (Williams) Cromwell, and he therefore represents a younger branch of the family, whose income was never large.

Little is known of Cromwell's early life. He was educated at the free school of Huntingdon under Dr. Thomas Beard, an austere Puritan. In 1616 he entered Sidney Sussex College at Cambridge, a stronghold of Puritanism, but soon withdrew, probably owing to his father's death, in 1617. There is no foundation for the reports by royalist biographers of wildness and profligacy in his early years, though he was boisterous and only moderately successful at his studies. He probably studied law for a short time at Lincoln's Inn. In 1620 he married Elizabeth Bourchier, daughter of a London merchant, and she seems to have brought him a considerable dowry. The few glimpses that we have of his life before the beginning of his active public career, which may be said to date from the meeting of the Long Parliament in 1640, leave no doubt as to which side he would espouse in the approaching struggle. For some years he was in the throes of a religious conflict, from which he emerged in a triumphant conversion. Throughout the rest of his life he was deeply religious, an ardent though tolerant Puritan. The earliest letter from his pen which has come down to us (1636) is a solicitation for a subscription to maintain a lectureship, by which means the Puritans supported preachers, owing to the neglect of this function by the established clergy. He was elected to the Parliament of 1628, where his only recorded speech is directed against the opponents of Puritanism. He watched the career of Gustavus Adolphus with eager sympathy, and it is thought that his own early military successes were in part a result of his careful study of Gustavus Adolphus's campaigns. He took less interest in purely political matters, but we know of three instances where he championed the poorer inhabitants of his districts whose rights of pasturage were threatened. He was fined £10 in 1630 for having neglected to be knighted, but we have no record of his having resisted the forced loan or the payment of ship-money. Yet there can be no doubt that he was



OLIVER CROMWELL

FROM AN ENGRAVING BY JAMES CALDWELL AFTER A PAINTING BY ROBERT WALKER

dissatisfied with Charles's arbitrary rule, and there is a tradition which corresponds well with circumstances, that he once intended to emigrate to New England. If this is true, it was probably between 1631 and 1636, and it may have been prevented by a legacy which fell to him in the latter year. He was elected to the Short Parliament in 1640, and to the Long Parliament in the same year.

Cromwell played a subordinate part in the deliberations of the Long Parliament. He had no share in the impeachment of Strafford. He was rather more interested in the constitutional reforms, but most of all in ecclesiastical matters, and joined Sir Henry Vane and Hampden in demanding the abolition of the episcopacy, 'root and branch.' On the outbreak of the Irish insurrection of 1641, it was he who proposed that Parliament should assume control of the militia. When the Civil War broke out in 1642, he was very active in securing the authority of Parliament in the eastern counties, and commanded a troop of horse in the battle of Edgehill, October 23, 1642. In 1643 the war everywhere went against Parliament except in the Eastern Association, where Cromwell not only kept the royalists at bay, but even gained ground. His one troop had grown to ten, and afterwards grew to fourteen, forming two regiments of the best-drilled cavalry in England. For his services in the Eastern Association, Parliament made him Lieutenant-General of the Army of the Eastern Association (1644), and appointed him a member of the Committee of both Kingdoms. In the battle of Marston Moor, July 2, 1644, he commanded the Parliamentary horse, whose final charge decided the fortunes of the day. Hitherto, the Parliamentarians had been inferior in cavalry, whose military importance was greater in those days than now. It was due to Cromwell that this inferiority was overcome. It is at about this time that the division of the Puritans into two parties clearly appears. The Presbyterians, who were largely in the majority in Parliament, were alarmed at the growth of religious sects in the army, and they were anxious for an accommodation with Charles in order to be free to suppress Independency. The army, on the other hand, had become the stronghold of Independency, and desired religious toleration and a vigorous prosecution of the war. Cromwell was the spokesman of the party of toleration. He impeached Manchester for half-heartedness in the prosecution of the campaign, and found support with the Commons, but not with the Lords. He then disinterestedly proposed the reorganization of the army under new leaders, and on the adoption of the New Model (q.v.), and the Self-Denying Ordinance (q.v.), assumed that his military career was over. On the contrary, he was appointed lieutenant-general in command of the cavalry, and by a charge of the Parliamentary horse, decided the day at Naseby, the last battle of the First Civil War, June 14, 1645. The distrust between the Presbyterian Parliament and the Independent army became an open breach when the Parliament not only proposed to disband the army without paying the arrears due to the men, but made overtures to Charles which seemed to the army a surrender of what they had been fighting for. Cromwell, now the recognized leader of the army, hesitated, as was his wont, and tried to mediate between the two parties, but

in the end threw in his lot with the army. It was he who ordered the abduction of the King from Holmby. In the Second Civil War, a consequence of this rupture, in which the King played off one party against the other, Cromwell defeated the Scots under Hamilton, who were over twice his number, in a remarkable three days' battle near Preston, August 17-19, 1648. The army now clamored for the life of the King, whose duplicity had caused the renewal of the war. For a time Cromwell held back, but when his mind was once made up no legal technicality could stop him. "I tell you we will cut off his head with his crown upon it," he cried roughly, in answer to an argument denying the jurisdiction of the High Court of Justice. He had nothing to do with Pride's Purge, being absent at the time, but he accepted the result of it, and was foremost in all the events leading up to the King's execution (January 30, 1649).

On the abolition of the monarchy, the position of the Commonwealth was extremely perilous. It was torn asunder by partisan strife, and it was without a friend in Europe. Scotland, alienated by the execution of the King and hostile to the dominant Independent and Military party, proclaimed Charles II. King, not only of Scotland, but of England and Ireland as well. Ireland demanded immediate attention, for the Second Civil War had its counterpart there, and a coalition of the various parties had all but driven the Parliamentary forces out of the island. Cromwell accepted the command of the forces destined for its reconquest on March 10, 1649, and landed at Dublin, August 13, with three regiments. At Drogheda, 'being in the heat of action,' he ordered the famous massacre of the garrison of 2800 men, which had refused to capitulate (September). This was in accordance with the strict rules of war of the time, though it had not been put into practice in England. Cromwell explained that it was a just punishment for the outrages of 1641, which he looked upon as entirely wanton and without provocation. The immediate military effect of the massacre was advantageous, since for a time town after town surrendered with little resistance, but its unfortunate political effect lasts until the present day. At Wexford there was another massacre, though not by Cromwell's order. In May, 1650, the resistance was so nearly broken that Cromwell left the completion of the conquest to his successors, Ireton and Ludlow, and hastened back to confront the danger from the side of Scotland. He swept away with impatience Fairfax's legal objection that the Scots had a right to choose their own King, for he saw clearly that England must either coerce the Scots or be coerced by them. He defeated one Scotch army at Dunbar, September 3, 1650, and another, commanded by Charles II. in person, exactly one year later at Worcester. While he had to be on his guard from this time forth against plots and uprisings, Worcester marks the end of armed resistance to his rule. He brought Scotland and Ireland (or the Protestant part of Ireland) into legislative union with England, the first union of the three kingdoms, and gave them free trade and a better administration of justice, but the taxes to support the English garrisons were heavy. In addition, Ireland groaned under the attempt to transplant her Catholic population, or, as the plan was afterwards modified, her Catholic land-owners, to the

wilds of Connaught in order to make way for English settlers. Cromwell's treatment of Ireland was pitifully harsh, but it was caused principally by his complete ignorance of Irish affairs, though his ignorance was not greater than that of his countrymen.

The problem which now confronted the leaders of the Commonwealth was the substitution of a permanent constitutional government in the place of the provisional Rump. The withdrawal of the Cavalier party on the outbreak of the Civil War, and the expulsion of the Presbyterian members in the Pride's Purge, had left only sixty or seventy members in habitual attendance in Parliament, whose power depended solely upon the support of the victorious army. Not only had they made themselves very unpopular by their harsh measures, but they refused to give way to a newly elected and more truly representative Parliament which the army desired, unless they were made members of the new Parliament without election, and clothed with power to exclude undesirable new members, especially those of royalist sympathies. In the course of the prolonged dispute, they were guilty of what Cromwell considered a breach of good faith, whereupon he angrily dissolved them on April 20, 1651, to the great satisfaction of the English nation. According to Cromwell's view, the army was the only constitutional authority left standing, and as the head of the army, he and his officers constituted the Nominated or Barebones Parliament (q.v.) of 149 members (of whom five represented Scotland; and six Ireland), who had been nominated for the purpose by the Congregational churches. This Parliament soon showed such a readiness to adopt radical and impossible measures, and was so torn asunder by party strife, that when the Moderates rose, early on the morning of December 12, 1653, and voted its dissolution, Cromwell was greatly relieved, though he had no previous knowledge of the conspiracy. The officers thereupon adopted a written Constitution, called the *Instrument of Government* (q.v.), which is of great interest from the point of view of institutional history, under which Cromwell, on December 16, assumed the title of Protector. An elected Parliament of one House was provided for, whose powers were defined by the Instrument. The first Parliament which met under its provisions, on September 3, 1654, is of great importance to a correct understanding of the Protector's treatment of his Parliaments. He invited a revision of the Instrument, but in the debates on it the Parliament showed signs of making itself perpetual, of taking away liberty of conscience, and of reducing both the army and the Protector to its exclusive control, thus breaking down the balance of power between the Protector and Parliament which the Instrument had sought to establish. Cromwell interfered by force and excluded from the House all who refused to sign an agreement not to alter the Instrument in these 'four fundamentals.' This incident is crucial in the appreciation of Cromwell's Parliamentary difficulty. It should be remembered that he was never, like Pym and Hampden, a champion of Parliamentary institutions as such, but rather of Puritanism. He opposed the King, not because he believed in the rights of the majority, a conception foreign to his point of view, but because he was opposed to the Laudian ecclesiastical system. There is

therefore nothing inconsistent in his opposing a Parliament which was trying to make itself supreme, or which was endangering religious toleration and the highest interests of Puritanism. Furthermore, his demands were moderate, for, says Mr. Gardiner, "his *four fundamentals* have been accepted by the Nation and are at this day as firmly rooted in its conscience as Parliamentary supremacy itself." The problem was insoluble in his day, for the reason that there was no nation standing back of both Protector and Parliament to which appeals might be made, partly because the nation was disaffected, and partly because it was not sufficiently educated in political thought. Cromwell dissolved the Parliament without coming to an agreement with it, and without receiving the necessary supplies. In the year following, Penruddock's rising drove the Protector to acts as illegal as any of which Charles I. had been guilty. He divided England into ten military districts, over which he placed major-generals, with extensive police powers backed by military force, the estates of royalists being taxed by his own arbitrary power to support the scheme. It was a success as a police measure, but the nation groaned when Cromwell used this method to enforce a stricter standard of Puritan morality than the people were ready to accept. The foreign wars made new supplies necessary, and in 1656 the Protector called his last Parliament, from which his council first excluded one hundred undesirable members. Upon the discovery of a plot against the Protector's life, Parliament drew up a new Constitution called the *Humble Petition and Advice*, providing for an Upper House and offering Cromwell the title of King. Cromwell hesitated for some weeks, but finding the title unpopular with the army, he at last declined it. The *Petition and Advice* was then passed with the title Protector substituted for that of King, and was adopted in place of the *Instrument of Government*. Upon the second session of the Parliament in January, 1658, it was found that the promotion of Cromwell's supporters to the Upper House had given the republicans a majority in the Lower House. They not only insisted upon revising the Constitution anew, but were forming conspiracies of a dangerous sort, whereupon Cromwell dissolved them, February 4. He had failed to transform the military into a civil State.

The vigor with which Cromwell conducted England's foreign affairs has been much admired. He had little to do with the Dutch War, which he disliked as a war against a Protestant power. This he brought to a successful conclusion April 5, 1654. The two leading nations of Europe were at war and bidding for his alliance. He was at first inclined to favor Spain, partly from his sympathy for the French Huguenots and partly because France supported Henrietta Maria and the Stuart cause. Spain, however, had prohibited English ships from sailing in West Indian waters, even though bound for an English colony. In December, 1654, Cromwell sent out a badly equipped expedition under Penn and Venables, which suffered a disastrous repulse in an attack against Santo Domingo, but seized Jamaica, whose importance was little appreciated at that time. This attack naturally precipitated a war with Spain in Europe in which Blake, having previously brought the Bey of

Tunis to terms (April 4, 1655), destroyed one Spanish treasure-fleet at sea (September 8, 1656) and sank another in the harbor of Cadiz (April 20, 1657). Two treaties were signed with France, the first on October 24, 1655, providing for the expulsion of the Stuarts from French territory, the second on March 23, 1657, providing for a joint attack upon the Spanish Netherlands, in which the English greatly distinguished themselves before Dunkirk, in the battle of the Dunes, June, 1658, and secured Mardick and Dunkirk as their share of the spoils. But while Cromwell succeeded by force of arms in making England universally feared, he was very ignorant of European politics and his aims were faulty. He was completely under the illusion that the Catholic powers were on the point of combining to crush Protestantism and he was constantly negotiating with Charles X. of Sweden, whom he erroneously regarded as a second Gustavus Adolphus, to form a counter Protestant league, not knowing that it was impossible to reconcile, for religious purposes, either Sweden and Holland on the one hand, or France and Spain on the other. Nor should it be forgotten that his foreign enterprises greatly increased the burdens of a heavy taxation which alienated the people of England from his rule. He died on September 3, 1658.

BIBLIOGRAPHY. The chief source of information in forming an estimate of Cromwell's character will always be his own words, first collected by Carlyle, *Letters and Speeches of Oliver Cromwell* (London, 1845). The speeches are to be found in Stainer, *Speeches of Oliver Cromwell, 1644-58* (London, 1901). His Parliamentary career is to be followed in *Parliamentary History*, vols. ix.-xxi. (London, 1760-62), together with the numerous memoirs, of which those of Whitelock and Ludlow deserve special mention. The *Calendars of State Papers, Domestic Series*, together with the great collections of Rushworth, Clarendon, Somers, and Carte, are rich mines of material, while the *Thurloe State Papers* (London, 1742) contain the greater part of the diplomatic correspondence. Gardiner, *Const. Docs. of the Puritan Revolution* (London, 1899), is invaluable. Of the older writers, Guizot and Ranke are still useful, but they are largely superseded by the great works of Gardiner, *History of England, 1603-42* (10 vols., London and New York, 1883-84); *The Great Civil War* (London and New York, 1895); and the *History of the Commonwealth and Protectorate* (London and New York, 1894-1901). Gardiner has summarized the results of his researches in *Cromwell's Place in History* (London and New York, 1897) and *Oliver Cromwell* (London, 1901). Hardly inferior to Gardiner's work is Firth, *Oliver Cromwell and the Rule of the Puritans in England* (London and New York, 1900). The biographies by Harrison (London, 1888) and Morley (New York, 1900) are brilliant, but not authoritative. The *Oliver Cromwell* of Theodore Roosevelt (New York, 1900) is brief and readable. Gardiner and Mullinger, *Introduction to the Study of English History*, part ii. (London, 1894), contains an account of the literature of the period, both contemporary and modern.

CROMWELL, RICHARD (1626-1712). Lord Protector of England. The third and eldest surviving son of Oliver Cromwell; he was born at Huntingdon, October 4, 1626. When Oliver be-

came Protector, he wished to train his son as his successor. Richard entered Parliament; was appointed First Lord of Trade and Navigation, and became Chancellor of Oxford. But of an amiable temperament, he was more addicted to pleasure and sport than statecraft, and after his father's death in 1658, retained the Protectorship for not quite nine months, until his willing demission in May, 1659. He lived in retirement on the Continent during twenty years, and returned to England in 1680. He died at Cheshunt July 12, 1712. Consult Guizot, *History of England Under Richard Cromwell* (London, 1856).

CROMWELL, THOMAS, Earl of Essex (c.1490-1540). An English statesman and Henry VIII.'s prime agent in effecting the Reformation. He was born at Putney, near London, where his father engaged in the varied pursuits of blacksmith, brewer, innkeeper, fuller, and shearer of cloth. After a meagre education, he went to Antwerp as a clerk in a factory, and successfully devoted his spare time to learning languages. He spent some time in Italy as a soldier and trader. He returned to England in 1513, and, while following the paternal vocations, developed into a money-lender, a lawyer, and an influential citizen. He received a trusted appointment from Cardinal Wolsey, and under his patronage entered Parliament, where his able speeches attracted attention. He successfully defended his master against the bill of impeachment; and Henry VIII., appreciating his talent, made him his private secretary. He received a succession of honors, which, after knighthood in 1513, included the Chanceryship of the Exchequer (1533), Mastership of the Rolls and Vicarship-General of Ecclesiastical Affairs (1535), the office of Lord Privy Seal (1536), and that of Lord Chamberlain (1539), and culminated in his creation as Earl of Essex in 1540. For seven years, by subservience to the King, he held supreme sway in the royal council and controlled all the administrative departments. He carried out faithfully the monarch's schemes to establish the Reformation. His methods in suppressing the monasteries earned him the designation of *malleus monachorum*, the Hammer of the Monks. He was very unpopular, and after promoting the marriage of Henry with Anne of Cleves, the King's aversion to the Queen was extended to the instigator of the union. Henry assented to a bill of attainder for treason on a long indictment of offenses, and, after a piteous entreaty for mercy, Cromwell was clumsily beheaded on July 28, 1540. Froude praises his character. Consult: Drayton, *Historie of the Life and Death of the Lord Cromwell* (London, 1609); Hook, *Lives of the Archbishops of Canterbury*, vol. vi. (London, 1868); Froude, *History of England* (London, 1881-82); Merriam, *Life and Letters of Thomas Cromwell* (Oxford, 1902).

CROMWELL, THE LIFE AND DEATH OF THOMAS, LORD. A play of unknown authorship, once attributed to Shakespeare, and entered at Stationers' Hall in 1602. It was founded on the tragic fate of the Earl of Essex. See THOMAS CROMWELL.

CRONACA, kró'ná-ká, IL. See POLLAIUOLO.

CRONEGK, kró'něk, JOHANN FRIEDRICH, Baron von (1731-58). A German poet. He

was born at Ansbach (in the principality of that name), was educated at Leipzig and Halle, and from 1754 was a councillor of the principality. His best-known work is his tragedy *Codrus* (1757), in rhymed Alexandrines—a somewhat rhetorical but sonorous imitation of the French classic manner—which was awarded the prize offered by the bookseller Nicolai for the best German tragedy. His ode *Der Krieg* (1756) was praised by Lessing. He was among the first to direct German scholarship toward the study of Spanish literature. Consult the biography by Gensel (Leipzig, 1894).

CRONENBERG, krō'non-bērĕk. See KRONENBERG.

CRONHOLM, krōn'hōlm, ABRAHAM PETER (1809-79). A Swedish historian. He was born at Landskrona, was educated at Lund, and in 1849 became professor of history in that city. His works, which are based upon a careful personal study of the archives of Stockholm, Copenhagen, Berlin, Dresden, Vienna, and of other leading European cities, include the following: *Formordiska Minnen* (1833-35); *Catholska Ligan och Huguenoterne* (1839); *Skånes politiska historia* (1847-51); *Sveriges historia under Gustaf II. Adolphi regering* (1857-72).

CRONJE, krōn'yc, PIETRUS ARNOLDUS (1835—). A Boer soldier. In the campaign of 1881 against England, he distinguished himself at Doornkop and at Majuba Hill, where he was second in command. In 1896 he dispersed the raiders led by Dr. Jameson into the Transvaal. At the outbreak of the war against England in 1899, he was stationed with 6000 troops on the western frontier. At Modder River (November 28) he fought an indecisive battle with Lord Methuen, who was marching with his division to the relief of Kimberley, in which he inflicted terrible loss on the enemy, and at Magersfontein (December 11) he won a brilliant victory over the same general. Immediately upon the beginning of Lord Roberts's invasion of the Orange Free State, in 1900, he sent a portion of his army to the north, and with the remainder sought to oppose the English advance on Pretoria. At last surrounded, he entrenched himself at Paardeberg, and, under a scathing artillery fire, sustained that position until the failure of food and ammunition compelled him to surrender, with some 4000 troops and six guns, on February 27—the anniversary of Majuba Hill. He was thereupon sent as a prisoner of war to Saint Helena. He was known as one of the most sagacious of the Boer leaders, and, in addition to his military command, held civil office as a member of the Executive Council of the South African Republic.

CRON'OS. See SATURN.

CRONSTADT, krōn'stāt. See KRONSTADT.

CROOK, krūk. A coal-mining town in Durham, England, 4½ miles northwest of Bishop Auckland. Population, in 1901, 11,470.

CROOK (ME. *croke*, *crok*, Icel. *krōkr*, hook). In musical instruments, such as the French-horn or trumpet, a circular tube, which fits into the end of the instrument next the mouthpiece, for the purpose of lengthening the tube of the instrument and thus altering the pitch to suit the key of the music. The notes of the parts of these instruments are always written in the natural

key of C, with the name of the key of the piece marked in letters.

CROOK, GEORGE (1828-90). An American soldier, born near Dayton, Ohio. He graduated at West Point in 1852, and spent the next nine years in California. He became colonel of the Thirty-eighth Ohio Volunteers and captain of the Fourth Infantry in the Federal Army in 1861, served throughout the Civil War, and in March, 1865, was brevetted brigadier-general and major-general for gallant and meritorious services during the war. In 1866, as lieutenant-colonel in the regular army, he was sent to Idaho, where he remained until 1872, in almost constant warfare with the Indians there. He subdued the tribes in Arizona in 1872, and in 1875-77 completely crushed the power of those in the Northwest, after Custer's defeat at their hands. He protected the Apaches (1882) from the encroachments of the Mormons and others on their lands, and defeated the Chiricahuas in 1883. Obtaining sole charge of all the tribes, he encouraged them in their industries, and made them self-supporting communities. He was promoted to the rank of brigadier-general in 1873, and to that of major-general in 1888.

CROOKBILL. See WRYBILL.

CROOKED ISLAND. One of the Bahamas (q.v.), British West Indies. It contains 160 square miles (Map: West Indies, K 3). In common with some others of the group, it is valuable chiefly for its salt. Population, over 600.

CROOKED LAKE, or KEUKA LAKE. A beautiful sheet of water in Steuben and Yates counties, in the western part of New York, about 18 miles long and 1 to 1½ wide. It lies in a deep valley, and its outlet at the north end flows into Seneca Lake.

CROOKES, krūks, Sir WILLIAM (1832—). An English physicist and chemist, born in London. He studied chemistry, and later assisted Hofmann at the Royal College of Chemistry. In 1854 he became superintendent of the meteorological department of the Radcliffe Observatory, Oxford, and in 1855 professor of chemistry at the Chester Training College. He is the editor and proprietor of the *Chemical News*, which he founded in 1859, and has edited the *Quarterly Journal of Science* since 1864. He has been a fellow of the Royal Society since 1863, and was knighted in 1897. He is an authority of the first rank on sanitary questions, especially the disposal of the sewage of towns, and his method of producing extreme vacua rendered incandescent electric lighting a practical possibility. His original researches in chemistry and physics led to the discovery of the metal thallium in 1861. Subsequently he devoted several years to an elaborate investigation on the atomic weight of that element. Among his other discoveries may be mentioned the sodium amalgamation process for separating gold and silver from their ores (1865), and especially his new method for the spectroscopic investigation of substances—one of the numerous and brilliant results of his prolonged studies of 'radiant matter.' He also devised the radiometer (q.v.), and later the otheoscope, a greatly improved form of the radiometer. Among his publications may be mentioned: *A Practical Handbook of Dyeing and Calico Printing* (2d ed., 1883); *Select Methods*

of *Chemical Analysis* (4th ed., 1894); an English translation of Wagner's *Chemical Technology* (2d ed., 1894); and papers on radiant-matter spectroscopy. His original views on the genesis of the elements may, with the development of knowledge, form an important contribution to chemical philosophy.

CROOKES TUBE. A sealed vessel of glass from which the air has been exhausted and a high vacuum obtained, through which a current from an induction coil or other source of high-potential electricity is passed. A Crookes tube differs from a Geissler tube (q.v.) in the higher degree of its exhaustion and in several important particulars which will appear in the description of its operation given below. The name is derived from Sir William Crookes (q.v.), who was able by his improvements in the Sprengel pump (see AIR-PUMP) to obtain vacuum tubes of greater efficiency than those of previous investigators. Crookes was not the inventor of the highly exhausted tube, as Hittorf, of Münster (1869), had performed a number of experiments with tubes having a comparatively high vacuum, but it remained for the English investigator to push the experiments still further and to formulate hypotheses and theories.

A Crookes tube contains two or more electrodes known as the cathodes and anodes. These are formed by platinum wires which pass through the glass walls of the tube and terminate in metallic plates of the material and shape desired for the experiment. The exhaustion is effected by connecting the tube to a mercurial air-pump and then sealing it when the proper point is reached. The terminals are then connected with an induction coil which is set in operation. The important peculiarity of such a vacuum tube noticed by Professor Hittorf consists of a fluorescence (q.v.) or golden-green glow produced on the glass opposite the cathode. There is not the brilliancy of glow that is found throughout the tube as in the Geissler tube, and the rays which produce the fluorescence issue from the surface of the cathode in straight lines normal or perpendicular to that surface, not being bent to follow the shape of the tube, as would be seen in tubes of a less degree of exhaustion. These cathode rays have many other interesting properties. They may be deflected by a magnet, and they cause a number of substances, such as diamonds and rubies, on which they impinge, to become brilliantly phosphorescent; their energy is sufficient to heat to a high temperature a surface on which they fall and can also be exhibited in causing a small wheel with mica vanes, mounted within the tube, to revolve as a result of the impact. Crookes used cathodes of plane, convex, and concave surface, from which the rays would be emitted in beams either parallel, diverging, or converging. After studying these rays and their properties he concluded that the discharge from the cathode represented a new form of matter which he considered as existing in an ultra-gaseous or radiant state. The most important use of the Crookes tube is for the production of Röntgen rays, or X-rays (q.v.), which are the rays passing out from the tube opposite the cathode. To produce these rays a tube must be employed where the vacuum is adapted to the work in hand, and there are self-regulating tubes on the market in which this property is obtained. See ELECTRI-

CITY for an account of the passage of a current through rarefied gases.

CROOKES VACUUM. See MATTER, Section on *Theories of Matter*.

CROOKSTON, kryk'st'on. A city and the county-seat of Polk County, Minn., in the northwestern part of the State; on the Red Lake River, which affords abundant water-power, and on the Great Northern and the Northern Pacific railroads (Map: Minnesota, B 3). It contains a fine court-house and municipal buildings, Crookston and Button business colleges, a gymnasium, and a public library. The city derives a considerable trade from a tributary agricultural country, and manufactures lumber, farm machinery, wagons, carriages, sleighs, etc. Settled in 1872, Crookston was incorporated in 1879. The government is administered under a charter of 1883, which provides for a mayor, annually elected, and a municipal council. Population, in 1890, 3457; in 1900, 5359.

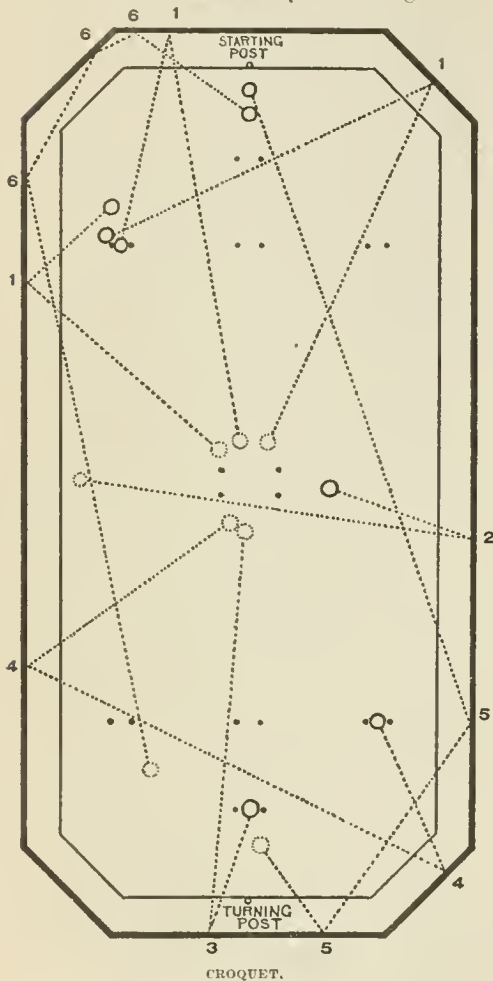
CROPPIES. A derisive nickname given by the Protestant Irish to their Catholic opponents in the time of the English Revolution of 1688. The name refers to the tonsure of the priests. The Roundheads were so called in 1642. There is a factional Irish song called "Croppies Lie Down!" which is a favorite with Orangemen.

CROPSEY, JASPER FRANCIS (1823-1900). An American painter, born at Rossville, N. Y. At first he studied architecture, but he abandoned it to study art under Edward Maury, and in 1847 visited Italy, where he painted "The Pontine Marshes" and other pieces. Afterwards he spent seven years in London, and exhibited at the Royal Academy. His "Autumn on the Hudson" and "Richmond Hill" were praised by John Ruskin. After his return to America he lived in New York City and at Hastings-on-the-Hudson. Cropsey's work is old-fashioned now, but he was one of the best of the so-called 'Hudson River School.' His subjects are well composed and his coloring not without merit, although hard and often crude. Other pictures by him are: "Niagara Falls;" "Peace;" "War;" "The Sibyl's Temple;" and "High Tom, Rockland Lake."

CROQUEMITAINE, krók'mé'tân' (Fr., from *croquer*, to crunch). A French monster or boggy invoked by nurses to frighten unruly children. In L'Épine's *Légende de Croquemitaine*, Mitaine, a goddaughter of Charlemagne, goes in search of the Castle of Croquemitaine, near Saragossa.

CROQUET, krô-kâ' (apparently a variant of Fr. *crochet*, hook). No other open-air game played to-day has had such strange fluctuations of fortune as croquet. It was a favorite game at the courts of kings two hundred years ago, yet by the end of the eighteenth century it had sunk into oblivion, and, except in a remote portion of Ireland, had been forgotten and unpracticed. From that country it was retransported across the Channel to England some time previous to 1860, and then the playing of the game became again so popular for twenty years as to assume the proportions of a national game. It had its national association, and in every hamlet the click of the croquet-ball was to be heard. It traveled over the Atlantic, where it was almost as popular, and by 1882 it demanded

a national convention to settle a uniform code of American rules. Yet in both countries by 1894 it had been so entirely supplanted by lawn tennis that the English national association went out of existence, and in America only a few of its votaries remained. About 1900 it again came into vogue in England, while in America, under the name of roque (q.v.), it has become a highly scientific and enthusiastically followed game.



CROQUET.

It is played either on a court of grass or closely packed earth, on which a number of arches (from six to ten) have been placed upright in a defined order. Each player has a mallet and a ball. Two can play the game, but it is a better game when played by the maximum number allowed (eight), divided into pairs of partners, each playing alternately. The object is to get the ball through every arch or hoop in due order, and to keep opponents from doing so, by interference within the rules.

The English and American methods varied from the first—in England the championship round was through six hoops arranged in a prescribed form; in America it was through ten hoops, arranged in entirely different order. In England the championship court was rectangular, in America the corners of a court 36×72

feet were cut off. Then, too, the size of the balls and the width of the hoops varied; in England the hoops were at first 15 to 18 inches wide at the base; gradually they were reduced to $5\frac{1}{2}$ inches, and ultimately to $3\frac{3}{4}$, leaving $\frac{1}{2}$ of an inch margin on either side of the ball. Even this small margin was reduced in America. In many other respects the American game has been made more difficult.

The few who have restored croquet to popularity, and made it a highly scientific game, with shorter and better mallets, specially prepared courts with rubber cushions, and more difficult hoops, played the eighteenth annual championship of the National Croquet Association, under the old name of croquet, in 1899, after which they adopted the new name roque, to mark the distinction between the two games. They made Norwich, Conn., their headquarters. Enthusiasts place the game above billiards in scientific possibilities; and, without the full admission of that claim, it may be allowed that it is the nearest outdoor game to billiards in all its essentials.

The rules of the two games, technical terms, and diagrams, will be found in *Croquet and Roque*, in Spalding's Athletic Library, New York. See also *The Complete Croquet Player* (London, 1874 and 1896); Lillie, *The Book of Croquet* (London, 1872).

CROSBY, kröz'bī, ALPHEUS (1810-74). An American educator and author. He was born at Sandwich, N. H., graduated at Dartmouth in 1827, and studied theology at Andover from 1831 to 1832. He became professor of Latin and Greek at Dartmouth in 1833, and of Greek only in 1837. From 1857 to 1865 he was principal of the Salem (Mass.) Normal School. He published a Greek grammar, an edition of the *Anabasis*, *Greek Fables*, *Greek Lessons*, *Greek Tables*; also *The Second Advent* (1850), and *First Lessons in Geometry* (1851).

CROSBY, FRANCES JANE (1820—). An American hymn-writer, born at South East, Putnam County, N. Y. She lost her eyesight when an infant six weeks old. After attending the Institution for the Blind, in New York City, for nine years, she became instructor of Greek and Roman history and of various other branches at that institution, and continued to teach there until her marriage to Alexander Van Alstyne in 1858. Her sacred publications include several thousand hymns, some of which are contained in Moody and Sankey's *Gospel Hymns*, and in Mr. Sankey's *Sacred Songs and Solos*. Among her best-known verses are: "Safe in the Arms of Jesus;" "Pass Me Not, O Gentle Saviour;" "Jesus is Calling;" and "I am Thine, O Lord." Her songs include the well-known compositions, "There's Music in the Air" and "Hazel Dell." Her secular poems have been published under the titles *The Blind Girl and Other Poems* (1844) and *Bells at Evening and Other Poems* (1898).

CROSBY, HOWARD (1826-91). An American clergyman, born in New York City. He graduated at New York University in 1851, was professor of Greek there until 1859, and subsequently held the same chair in Rutgers College. He was ordained in 1861, and became pastor of the First Presbyterian Church, in New Brunswick, N. J. From 1863 to 1891 he was pastor of the Fourth Avenue Presbyterian Church, New York, and from 1870 to 1881 was chancellor of

his alma mater. He was instrumental in organizing, and for several years was president of, the Society for the Prevention of Crime, and in this capacity was prominent in his activity against the illegal liquor traffic. He was a member of the American Committee which revised the New Testament. Besides a great many sermons and addresses, he published: *The Lords of the Moslem* (1851); *Notes on the New Testament* (1863); *Social Hints for Young Christians* (1866); *Jesus, His Life and Works* (1870); *Thoughts on the Pentateuch* (1873); and an edition of the *Œdipus Tyrannus* of Sophocles.

CROSBY, JOHN SCHUYLER (1839—). An American soldier. He was born in Albany, N. Y.; was educated at New York University; was appointed second lieutenant of the Fifth Artillery in 1861; served throughout the Civil War, and, after being three times brevetted, acted for a time as adjutant-general on the staff of General Canby. Subsequently he served as aide, with rank of lieutenant-colonel, under Sheridan and Custer against the Indians, but resigned from the army in 1871. He was United States Consul at Florence, Italy, from 1876 to 1882, was Governor of Montana Territory from 1882 to 1884, and from 1884 to 1886, when he resigned, was First Assistant Postmaster-General.

CROSBY, PEIRCE (1824-99). An American naval officer. He was born near Chester, Pa., entered the navy in 1838, and in 1861 served in Chesapeake Bay. He participated in the capture of New Orleans and the bombardment of Vicksburg, and in 1863-64 was employed chiefly in blockade duty. In 1864 he was placed in command of the *Metacombet*, and participated in the attack on Mobile. He was promoted to be captain in 1868, commanded the South Atlantic squadron, was made rear-admiral in 1882, and in 1883 was retired.

CROSBY HALL. A mediæval Gothic dwelling-house in London on Bishopsgate Street, built in 1466 by Sir John Crosby. It is the scene of a part of Shakespeare's *Richard III.* Richard of Gloucester lived here for a time, and Sir Thomas More, who purchased the house, wrote his *Utopia* in it. Some of the original chambers still remain. The hall, after having been used for a variety of purposes, is now an eating-house.

CROSIER (ME. *croser, crocer*, from *eros, crosse, croce*, cross, from Latin *crux*, cross). The pastoral staff of a bishop. Throughout antiquity a hooked or curved staff had been an emblem of civil and particularly of religious authority. Hittite, Babylonian, and other Oriental priests carried it; so did the Roman augurs. It was adopted by early Christian bishops as a symbol of authority. It took two forms: that of the *tau* with a short transverse top-piece, giving the shape of a small *crux commissa*, in which the cross appears as a symbol of the authority by which the

bishop ruled; and that of the curved end or volute, imitating the shepherd's crook, emblem of the office of the bishop to keep the Lord's sheep. The *tau* form seems the earlier, judging from extant monuments, for no records of the crook form exist as early as the Carolingian period. The *tau* often ends in the head of a lion, emblem of episcopal power; the crook often impales a serpent or a dragon, symbol of the triumph over evil. Abbots were often privileged to carry the *crozier*, as a symbol of their pastoral office, as early as the fifth century, and long before the other episcopal insignia of mitre and cross were allowed to them. Some of them still retain the *panisellum* (a small silk veil hanging to the staff), which has long disappeared from those of bishops. Consult: Barraud and Martin, *Le bâton pastoral* (Paris, 1856); Lind, *Ueber den Krummstab* (Vienna, 1863). See COSTUME, ECCLESIASTICAL.

CROSSMAN, HENRIETTA (1870—). An American actress, born at Wheeling, W. Va., September 2, 1870. She made her début in 1889 in *The White Slave*, and later was successively under the management of Daly and the Frohmans. In 1897 she was married to Maurice Campbell. In the following year she became a star. Her greatest successes have been her production of George C. Hazleton's *Mistress Nell*, October 9, 1900, in New York, where it ran for over one hundred performances, and her *Rosalind in As You Like It* (February 27, 1902), which ran for eight weeks at the Theatre Republic, New York. In the autumn of 1902 she opened her season with *The Sword of the King*.

CROSS (AS. *crūc*, OHG. *crūci, chrūze, chrūz*, Ger. *Kreuz*, Prov. *croz, croz*, OF. *crois, croix, croiz, crūz*, Fr. *croix*, It. *croce, cross*, from Lat. *crux, cross*). The cross was a common instrument of capital punishment among the ancients; and the death on the cross was deemed so dishonorable that only slaves and malefactors of the lowest class were subjected to it by the Romans. It was customary to proclaim the name and offense of the person crucified, or to affix to the cross a tablet (*album*) on which name and offense were inscribed. Malefactors were sometimes fastened on a simple upright stake, and so left to die, or they were impaled upon it, and to this upright stake the Latin name *crux* was originally and more strictly applicable; but very generally a *cross-piece* (*patibulum*) was added to the stake, to which the arms of the criminal were tied, or to which his hands were nailed. The person crucified often lived for days. When the *cross-piece* was fastened at right angles below the summit of the upright stake, the cross was called *crux inmissa* (the Latin cross); the Greek cross, where the *cross-piece* was set so low as to form four equal or nearly equal arms, is a variant of this form; when the *cross-piece* was fastened at right angles across the top of the upright stake, the cross was *crux commissa* (also called cross of Saint Anthony); and when it was formed of two beams crossing one another obliquely, it was *crux decussata* (also called cross of Saint Andrew). The cross was erected outside the gates of towns, but in places of frequent resort.

It appears that the cross was in use as an emblem, having certain religious and mystic meanings attached to it, long before the Chris-



CROSIER.

tian Era. The Spanish conquerors were astonished to find it an object of religious veneration among the natives of America. But the death of Christ by crucifixion led Christians to regard it with peculiar feelings of veneration and to adopt it as a symbol with express reference to the central fact of their religion. It was seen everywhere in Christian countries, in the home as well as in the church, where it formed an invariable ornament of the altar. The iconoclastic party contended against the worship of the cross, but the Church, while defining the sense in which worship might be offered to it, condemned their views. Though the word *latreia*, adoration, is used of the veneration paid to the cross, it is explained as only relative, and referred back to the person of the Crucified. This species of veneration, which is sometimes misunderstood on account of the restricted use of the word 'worship' in modern English, is solemnly paid in the Roman Catholic Church to pieces of the true cross (considered the most sacred of all relics) whenever exposed, and to other crosses, especially on Good Friday. The cross on the high altar, which has been wrapped in a violet covering throughout Passion-tide, is unveiled during the singing of the anthem "Behold the wood of the Cross, on which the Saviour of the world hung." It is then laid on the altar-steps, and the celebrant and other sacred ministers approach with genuflections and kiss it. After this a smaller cross is offered to the congregation, kneeling at the altar-rails, to be kissed. (See Cardinal Wiseman, *Lectures on the Offices and Ceremonies of Holy Week*, London, 1839.) The earliest account of the solemn veneration of the cross occurs in the *Peregrinatio Sanctæ Silviæ ad Loca Sancta*, recently discovered by Gamurrini and published in Rome, 1887-88, which describes a pilgrimage to Jerusalem during the episcopate of Saint Cyril, probably in the year 384 or 385. The sign of the cross has been made in Christian worship, since the second century at least, as an act of homage to God in remembrance of the Redemption, and of blessing to the person or object over which the sign is made. It is differently made in the Roman Catholic and Eastern Churches, and has been disused among most Protestants, as a ceremony of human invention tending to superstition. A cross was in the Middle Ages prefixed to most inscriptions and documents as a sort of consecration, and placed before signatures for the same reason; the latter practice is still retained by Roman Catholic bishops.

The forms given to crosses in art are endless; but the two leading types are the Latin cross, or *crux immissa*, supposed to be that on which Christ suffered, and the Greek cross, both of which are subject to many fantastic variations. The Greek cross forms the well-known cross of Saint George, which, adopted from the legends of that hero, was the national ensign of the English previous to the union with Scotland. (See UNION JACK.) The cross of Saint Andrew, or *crux decussata*, consisted of two shafts of equal length crossed diagonally at the middle. According to the legend, this was the form of cross on which Saint Andrew, the national saint of Scotland, suffered martyrdom. As the Scottish ensign, it is now blended with the cross of Saint George in the Union Jack. The Maltese cross, with its eight forked ends, was a form used by

the orders of knights. It is similar to the crosslet form where small crosses are formed at the ends.

SANCTUARY, BOUNDARY, OR MONUMENTAL CROSSES, as they are called, consist of an upright flat pillar, or obelisk, covered with sculptured devices, and set in a socket level with the ground. Occasionally they appear to have marked boundaries, but more frequently were monuments over the graves of heroes, kings, bishops, etc. In some instances they probably marked the verge of a sanctuary. The older of these crosses are said to be Scandinavian or Danish, and such are known as *runic crosses*, being inscribed with runes. We are told that the island of Iona at one time possessed 360 crosses, but all are now destroyed or dispersed, except one, called Saint Martin's Cross, standing in the grounds of the cathedral. It is a column of compact mica schist, 14 feet high, 18 inches broad, and 6 inches thick, and is fixed in a pedestal formed out of a massive block of red granite, about 3 feet high. In connection with certain ancient religious houses in Ireland, there were some very fine crosses of this kind, the most gigantic and impressive which still exists being that of Saint Luke's in the County of Louth. The prominence of such crosses extended to the East, where the Gothic and other tribes of the Caucasus, Georgia, and Armenia also used them prominently in church sculpture and in cemeteries.

MEMORIAL CROSSES are those which were erected in memory of some beloved object, or in commemoration of some event of local importance. In England there are some superb crosses of this kind: they are popularly called *Norman crosses*. This species of cross resembled a Gothic turret set on the ground, or on a base of a few steps, and was erected by Edward I. (1290) in memory of his queen, Eleanor, being placed on the spots where the body rested in its funeral progress to Westminster. Of the nine, two remain, at Northampton and Waltham.

TOWN OR MARKET CROSSES were erected as stands to preach from, or in commemoration of events regarding which it was deemed proper to evoke pious feelings. As these structures were incorporated with or surmounted by a crucifix, the term *cross* was so indelibly associated with them that it survived the religious character of the fabrics. The earliest examples of this kind consisted, probably, of tall crucifixes of wood, such as are still seen by the wayside in some Continental countries. Afterwards, stone shafts would be substituted; and according to the increase of market revenues, or progress of taste, these town crosses assumed that imposing character which they latterly possessed. Of the larger ornamental crosses of this kind, there are some striking specimens in England, such as that at Cheddar in Somersetshire, and that at Malmesbury in Wiltshire: both are open-vaulted structures, with a commodious space beneath, as a refuge for poor market-folks during rain, and surmounted with a kind of Gothic turret. At Chichester, Bristol, and Winchester, the market crosses, while similar in form, are of a higher architectural quality. Adjoining Saint Paul's in London, stood Paul's Cross, a structure which we read of as early as 1259, in the reign of Henry III. It was essentially a town preaching cross, and is associated with some interesting occurrences in history. Before this cross the

unfortunate Jane Shore, the mistress of Edward IV. from 1470 to 1483, was forced to do penance in the reign of Richard III. Here Dr. Shawe, in his infamous sermon, attempted to bastardize the children of Edward and eulogized Richard. In front of this cross sat Cardinal Wolsey, to hear fulminations against Luther; and about ten years later, by order of Henry VIII., preachers here delivered sermons in favor of the Reformation. At this cross Queen Elizabeth attended to hear a thanksgiving sermon for the defeat of the Spanish Armada. Here sermons continued to be delivered until 1643, when, with other so-called relics of popery, because they offended the Puritans, it was demolished by order of Parliament. Whatever was the original form of Paul's Cross, it was in later times a plain, pulpit-like fabric of wood, covered with lead.

The Scottish town crosses, while simple, had some distinguishing features. The more simple kind consisted of a shaft of stone, generally octangular in shape, and 12 or more feet in height. At the top was an ornamental capital, which bore a dial and vane, or the figure of a unicorn. The shaft sprang from the top of a graduated flight of circular or octangular steps. A specimen of this species of cross is seen in the market-place of Melrose. The grander market cross consisted of a tall stone shaft, such as just described, but instead of steps it sprang from the centre of an imposing sub-structure. This structure was circular, hexagonal, or octagonal, and from 10 to 16 feet high. The top formed a platform, which was surrounded with an ornamental stone parapet, and was reached by a stair inside. The sides of the building were decorated with pilasters, and bore various heraldic and other devices. Such were the crosses of Edinburgh, and such is the renovated cross of Aberdeen, the sides of which, however, are open. Losing their religious character, the Scottish market crosses were employed for royal and civic proclamations, and as places where certain judicial writs were executed. The general removal of these ancient and interesting structures has often been a matter of lamentation.

In the history of the cross as a Christian symbol, it is evident that it was used at first as a symbol of triumph, not of suffering. In the sarcophagi and mosaics from the fourth to the ninth century it often stands alone on the sacred rock from which flow the Four Rivers of Paradise. It is sometimes surmounted by the Constantinian monogram of Christ, the Labarum, and thus became the standard of victorious Christianity. It was inscribed within the circle around the head of Christ, thus forming the cruciform nimbus (q.v.). As an emblem of Christ, it preceded the crucifix, and it was not until the tenth and eleventh centuries that the figure of Christ had quite generally replaced on the cross the ornamentation which had previously been its usual decoration. Even when the monumental crucifixes had come into general use in central and southern Europe, the Northern nations (e.g. in Great Britain and Scandinavia) continued for centuries the use of the mere cross. The form of the cross given to the majority of churches in the later Middle Ages is more connected with the specific crucifixion than the mere cross, as is shown by the bend sometimes given in some church ground-plans,

imitated from the twist of the body on the cross. Consult: Stockbauer, *Kunstgeschichte des Kreuzes* (Schaffhausen, 1870); Fulda, *Das Kreuz und die Kreuzigung* (Breslau, 1878); Dobbert, *Zur Entstehungsgeschichte des Kreuzes* (1880); Bunsen, *Das Symbol des Kreuzes bei allen Nationen* (Berlin, 1876); Alger, *History of the Cross* (Boston, 1858); Mortillet, *Le signe de la croix avant le christianisme* (Paris, 1866); Zöckler, *Das Kreuz Christi* (Gütersloh, 1875).

CROSS. In heraldry (q.v.), one of the charges known as ordinaries.

CROSS, INVENTION OF FINDING OF THE. The name of the Church festival commemorative of the finding of the cross upon which Christ died by the Empress Helena, the mother of Constantine, in the year 326. As related by Socrates (*Ecclesiastical History*, I. xvii.), who wrote about 439, the story is this: In Christ's sepulchre she found three crosses, along with Pilate's tablet, and on the advice of Macarius, Bishop of Jerusalem, determined which was Christ's cross by taking the three to a sick woman, who touched the first two without avail, but was restored as soon as she had touched the third—so that was accepted as Christ's. Similar is the story in Sozomen (*Ecclesiastical History*, II. i.), who wrote a little later. From this time on for many centuries there was no question of the fact. Doubt has been cast upon it by the consideration that Eusebius, who wrote in the fourth century, and who was particularly explicit regarding everything relative to the Constantine family in his account of Helena's visit to the Holy Land (*Life of Constantine*, III. lii.), says nothing of her discovery of the crosses, nor when speaking of the erection of the church over the Holy Sepulchre (ib. III. xxviii. sqq.). It is also noteworthy that the Bordeaux Pilgrim, the author of the *Itinerarium Burdegalense*, writing in 333, says nothing in his description of the Holy Places of any cross being discovered in the Holy Sepulchre (*Itinerary from Bordeaux to Jerusalem*, Palestine Pilgrim's Text Society's Eng. trans., London, 1887, p. 24). Still Cyril of Jerusalem, writing in the Holy City in 347-348, uses this language: "He was truly crucified for our sins. For if thou wouldest deny it, the place refutes thee visibly, this blessed Golgotha, in which we are now assembled for the sake of Him who was crucified, and the whole world has since been filled with pieces of the wood of the cross" (*Catechetical Lectures*, iv. 10). And he alludes to the finding of the cross when writing to Constantius, the son of Constantine (*Ep. ad Const.*, c. 3). That Helena found three crosses and that she and many others believed that one of them was the cross of Christ may be accepted, though we have no confirmatory proof of its authenticity.

The festival of the Invention of the Cross may date from the visit of Helena, but unless it was at first local, the earliest certain mention of it is in the eighth century. In the Latin Church the day is May 3. In the Greek Church there is a festival of the Exaltation of the Cross on September 14. Consult, in favor of the story: J. H. Newman, *Essay on Ecclesiastical Miracles*; and as against it: W. C. Prime, *A History of the Invention, Preservation, and Disappearance of the Wood Known as the True Cross* (New York, 1877); and E. Nestle, *De Sancta Cruce, Ein Bei-*

trag zur christlichen Legendengeschichte (Berlin, 1889).

CROSS, JUDGMENT OF. See ORDEAL.

CROSS, ORDER OF THE HOLY. The name of several monastic or semi-monastic Orders. The origin of the first community bearing this name is lost in obscurity; but leaving aside legendary accounts, we find the Order definitely established in Italy as early as the accession of Pope Alexander III. (1150). The mother house was at Bologna, and their work was largely the care of the sick. They were confirmed by Urban III. in 1187, and spread until they numbered 200 convents in all parts of Italy; the Order declined later, so that Pius V. was obliged to reform it in 1568, and Alexander VII. to suppress it in 1656.

More important is the congregation of canons regular who were known in England as Crutched or Crossed Friars. This Order was founded by Theodore de Celles at Huy near Liège in 1211 and confirmed by Innocent III. five years later; it followed the rule of Saint Augustine, assimilated in many particulars to that of the Dominicans. It spread rapidly throughout the Netherlands, France, Germany, and England; in the latter country it possessed houses in London (1298), Oxford (1349), Colchester, Honiton, and other places. The Order was reformed from within in 1410. At the present day, while still faithful to its original spirit, it has very few houses, the principal ones being two in Holland and two in Belgium. Consult Hermans, *Annales Canoniarum Regularium Sancti Augustini, Ordinis Sanctæ Crucis* (3 vols., Bois-le-Duc, 1858).

A third association, the knightly Order bearing this name, is of some importance in the history of Bohemia. It is distinguished by a red six-pointed star in addition to the cross worn on the habit, and was originally an outgrowth of the Hospitaler brotherhood attached, in the first half of the twelfth century, to the hospital of the Poor Clares in Prague. In 1238 Gregory IX. constituted it a definite Order, under the rule of Saint Augustine. It spread throughout Bohemia and other lands now included in Austria-Hungary, and was one of the strongest bulwarks of the Church against the sectarian movements of the fifteenth and sixteenth centuries. At the siege of Eger in the Thirty Years' War they verified their knightly title by fighting at the head of the people. Their hospital at Prague was always open to new allies, and sheltered the first Jesuits in Bohemia in 1555, the Capuchins in 1599, and the Trinitarians in 1704. From 1561 to 1694 they practically supported the archbishops of Prague, who had been deprived of their possessions in the wars of religion, making them grand masters during their incumbency of the see. The Order now has less than a hundred members: its library consists of 50,000 volumes, including many *incunabula*, and manuscripts of great value for Bohemian history. Consult Jacksche, *Der ritterliche Orden der Kreuzherren mit dem rothen Stern* (Vienna, 1882).

The name is also borne by a small religious Order in the Episcopal Church in America, founded in New York, 1881, removed in 1892 to Westminster, Md., whose members occupy themselves largely in conducting missions and retreats.

CROSS, THE SOUTHERN. A constellation in the Southern Hemisphere, situated near the Antarctic Circle, and therefore never visible in northern latitudes. It consists of four bright stars, to which fancy, aided by Christian associations, gives the cruciform shape. The two brilliant stars which mark the summit and foot of the Southern Cross have nearly the same right ascension. The constellation, therefore, is almost perpendicular when passing the meridian, and these two stars act as pointers to the Antarctic Pole.

CROSS, VICTORIA. See VICTORIA CROSS.

CROSS, CHARLES ROBERT (1848—). An American physicist, born at Troy, N. Y. He graduated in 1870 at the Massachusetts Institute of Technology, and was instructor there in 1870-77. In 1877 he was appointed professor of physics and director of the Rogers laboratory. He established at the institute in 1882 the first American course in electrical engineering. He has published papers on electricity and acoustics in various scientific periodicals and in the *Proceedings of the American Academy of Arts and Sciences*.

CROSS, MARY ANN, or MARIAN. See ELIOT, GEORGE.

CROSS, MRS. GEORGE FREDERICK. See CAMERIDGE, ADA.

CROSS, RICHARD ASSHETON, first Viscount Cross (1823—). An English politician. He was born at Red Sear, Lancashire, graduated at Trinity College, Cambridge, in 1846, and in 1849 was called to the bar. He sat in Parliament as a Conservative, for Preston from 1857 to 1862, for Southwest Lancashire from 1868 to 1885, and for Newton Division, Southwest Lancashire, from 1885 to 1886. From 1874 to 1880 and in 1885-86 he was Home Secretary, and from 1886 to 1892 Secretary of State for India. He is a magistrate for Cheshire and Lancashire, and Lord Privy Council, and has published *The Acts Relating to the Settlement and Removal of the Poor* (1853) and *The General and Quarter Sessions of the Peace* (1858).

CROSS, WILBUR LUCIUS (1862—). An American educator and author, born at Mansfield, Conn. He graduated in 1885 at Yale University, and from 1894 to 1897 was instructor in English in the Sheffield Scientific School of Yale. In 1897 he was appointed an assistant professor in English, and in 1902 professor. In addition to magazine contributions on Ibsen, the novel, and other literary topics, and an edition (1900) of *Wacbeth*, with notes and an introductory essay, he has published a literary study, *The Development of the English Novel* (1899).

CROSSBILL. A bird of the genus *Loxia*, large finches with a singular bill, the mandibles—which are rather long, thick at the base, and much curved—crossing each other at the points when the bill is closed. These mandibles are capable not merely of vertical, but of lateral motion, and muscles of extraordinary power are provided for moving them: so that the crossbills readily obtain their principal food—the seeds of firs and pines—by tearing off the scales of the cones. They bring the points of the mandibles together (which they can do so as to pick up a very small seed) and insert them into the cone, when the

act of allowing the points to slip past one another exerts a powerful lateral movement, opening the scale; and the tongue, which terminates in a singular movable scoop, formed of a bone articulated to the os hyoides, or ordinary bone of the tongue, is inserted to detach the seed.



BEAK OF THE CROSSBILL.
Side view, shut and open, and top view.

The power of the bill is such that wood may be torn to pieces, and crossbills in confinement seem to take a mischievous pleasure in destroying the cage. An apple is cut to pieces almost in an instant, in order that its seeds may be reached, and flocks of these birds sometimes do great mischief in orchards. Three or four species are known, two of which are found in America, although only one, the common red crossbill (*Loxia curvirostra*), is numerous, and even this in most years is scarcely to be seen in the United States. It is a native of Europe, Asia, and North America, dwelling chiefly in evergreen forests and extending as far north as they do, not dreading the coldest climates. The American bird is generally regarded as a subspecies, and a second subspecies is found from the southern Rocky Mountain region to central Mexico. The white-winged crossbill (*Loxia leucoptera*) is the other American species, but is not so common as the preceding. Both species are red in the males and olive-brown in the females, the former species with blackish wings and the latter having wings crossed by two conspicuous white bars. They go about in small, chattering flocks, and are resident in the most northern parts of the United States and in Canada. They breed in the late winter or early spring, sometimes during very severe weather.

CROSS-BILL. In chancery or equity, a bill brought by the defendant in an equity proceeding against the plaintiff or other defendants, or both, in the same suit, either to obtain a discovery of facts in aid of the defense, or to bring the matters in dispute more completely before the court than could be done by a mere answer to the original bill. It must not introduce new parties nor new matter not embraced in the original suit, and is considered as an auxiliary suit in the nature of a defense to the original bill, the two proceeding together as one cause. However, the persons made defendants in it must answer, plead, or demur to it, or the relief demanded will be granted by default. Cross-bills are used in the equity practice of the United States and many of the State courts, and in the English chancery courts. See BILL: DISCOVERY, BILL OF; EQUITY; also PLEADING; and consult the authorities there referred to.

CROSSBOW. See articles ARBALEST: ARCHERY.

CROSS-BREEDING. See BREEDS AND BREEDING.

CROSS BUN. A small cake especially prepared for Good Friday, and in many towns of England cried about the streets on the morning of that day as 'hot cross buns.' Good-Friday buns were appropriately marked with the cross,

and hence the name. The origin of the practice is obscure. Most probably it is a relic of some heathen observance, to which the early Church gave a Christian significance.

CROSS-CUT. A term applied to a short transverse tunnel driven between two levels or gangways in a mine. In the case of parallel veins a cross-cut is often driven from one to the other, through the intervening barren rock.

CROSSE, ANDREW (1784-1855). An English physicist. He was born at Fyne Court, in the Quantock Hills, Somersetshire, and was educated at Bristol and Brasenose College, Oxford. He early devoted himself to the study of electricity, and in 1807 he commenced experiments with the view of forming artificial crystals. These experiments were quite successful, and, in the course of thirty years of quiet research, during which period he remained totally unknown to the scientific world, he obtained in this way no less than twenty-four minerals, including crystals of quartz, aragonite, carbonates of lime, lead, and copper, besides numerous other artificial minerals. These discoveries and other investigations in electricity were described at the meeting of the British Association for the Advancement of Science, at Bristol, in 1836. A few months later, while experimenting with some highly caustic solution, out of contact with atmospheric air, there appeared, as if gradually growing from specks between the poles of the voltaic circuit, certain animals of the genus *Acarus*. Crosse never affirmed that he had developed animal life out of inorganic elements, but simply that under physical conditions he could make *acari* appear, and not otherwise. This discovery aroused such violent criticism that Crosse retired from the world and for some time neglected his researches; but later he published papers on *Mode of Extracting Metals from Their Ores; On the Perforation of Non-conducting Substances by the Mechanical Action of the Electric Fluid; and On the Apparent Mechanical Action Accompanying Electric Transfer*.

CROSS-EXAMINATION. The examination of a witness on behalf of the party against whose interest he has been called and has given testimony. The object is to test the correctness of the testimony given, to disclose any prejudice, lack of intelligence, weakness of memory, or untruthfulness that may exist, and to break in any proper way the force of the direct examination. Greater latitude is allowed to counsel in cross-examination of an adverse witness than in adducing direct testimony for his own client. Thus, 'leading questions'—that is, those which in their form suggest or indicate the answer desired—are allowed in cross but not in direct examination. In the United States generally it is held that cross-examination should be limited to inquiry into matters drawn out on the direct examination, and if counsel asks questions as to new matter he thereby makes the witness his own, and, as to such questions, vouches for the truthfulness of his testimony.

Counsel must confine the questions to material and relevant matters; but the determination of whether the facts sought to be shown may be considered such is in the discretion of the court, and, when occasion seems to demand it, this is

exercised, especially in cases of cross-examination of expert witnesses, where it is necessary to show the standing and ability of the expert. Previous mistakes in collateral matters not connected in any way with the cause in issue have been allowed to be shown on this point.

The right to cross-examination should be exercised immediately after the examination-in-chief; but it is in the discretion of the court, upon good reason shown, to allow the privilege at a later stage of the trial. See EVIDENCE; EXAMINATION; TESTIMONY; WITNESS; TRIAL.

CROSS-FERTILIZATION. A term usually applied by botanists to the fertilization of flowers by insects and other means, so as to prevent too close in-and-in breeding. It has a wider significance, however, and may be applied to animals and the human races, in which latter case it is exemplified in the matter of race-crossing, or miscegenation. It is opposed to in-and-in breeding. There is no general term or word to express the fact of cross-fertilization or intercrossing between different stocks of a single species. We might adopt and extend the meaning of the word *exogamy*, used by anthropologists for marriage between members of different human tribes, and their term *endogamy* for in-and-in breeding; or coin a new word, as *hematogamy*, for unions or marriages between blood-relatives, and *chiastogamy* for cross-fertilization between members of different stocks of a single species. It is well known that in-and-in breeding among animals tends to sterility and degeneration; and, on the other hand, unions between different species, as well as members of widely distinct human races—such as marriages between the white and negro or other backward or primitive races—also tend to sterility, and assuredly to physical and moral degeneration. Race-marriage certainly is most unhappy in its results. While, as Darwin says, "nature abhors perpetual self-fertilization," the same is also true of miscegenation.

CROSS-FERTILIZATION IN PLANTS. As early as 1793 the German botanist Sprengel discovered the main facts, with many details, of the relation of insects to flowers. He observed the wonderful adaptation of the structure of many flowers to this or that species of insect visiting them; he satisfactorily proved that many kinds of flowers are cross-fertilized by insects, and that this was the object of the adaptations. He also observed that the presence of nectar and pollen attracted the insects and insured the continuance of their visits. Several later writers showed that the cross-fertilization of plants was beneficial to them. These discoveries were greatly extended by Darwin, who perceived the value of this process to the life and maintenance of the species. Darwin's observations were chiefly made on orchids, primulas, and so forth, and the subject was greatly extended by Hermann Müller, who, after many years of research, published his results on flowers and the structure and wonderful adaptations of the insects which visit them, in his elaborate volume entitled *The Fertilization of Flowers*. It was further demonstrated by Darwin that the cross-fertilization of plants results in increasing the size, height, rapidity of growth, strength, and vigor of the plant, and in increasing its fertil-

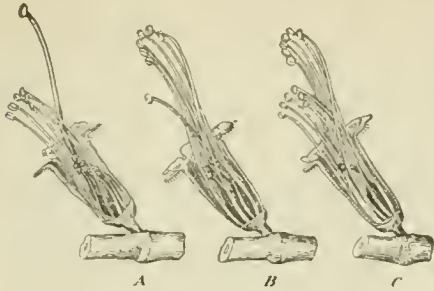
ity. As stated by Wallace (*Darwinism*, p. 309), these results were produced immediately, and not after several generations of crosses. Darwin planted seeds from cross-fertilized and self-fertilized plants on two sides of the same pot, which were exposed to exactly the same conditions. The result was that in most cases the difference in size and vigor in the two sets was marked, while the plants arising from cross-fertilized parents also produced more and finer seeds. These experiments confirmed the experience of breeders of domestic animals, where the evil effects of breeding members of the same litter of dogs, or intermarriage between blood-relatives, result in sterility and degeneration. The results of cross-fertilization between flowers of the same species, and the great interest excited by Darwin in the subject, have led to a detailed study of the various contrivances by which flowers secure cross-fertilization, and this has led to the view that at least the irregular flowers, such as those of the pea, sage, and the orchid families, are, in reality, due to the visits of insects—a subject specially worked out by the Rev. George Henslow in his *Origin of Floral Structures*.

Modes of Securing Cross-Fertilization in Plants.—Of the simpler modes there are four—viz. (1) By dichogamy, where the anthers and the stigma become mature or ready for fertilization at slightly different times on the same plant, as in the geranium, thyme, arum, and others; (2) by the flower being self-sterile with its own pollen, as in the crimson flax; (3) by the stamens and anthers being so situated that the pollen cannot fall upon the stigma, while it does fall upon some bee or moth which carries it to the stigma of another flower (malva); (4) by the male and female flowers being on different plants, as in dioecious flowers, the pollen being carried to the stigmas by the wind or by insects. See POLLINATION; BUMBLEBEE.

The more complex mode by which exogamy is brought about is seen (1) in the case of the loosestrife (*Lythrum salicaria*), a polymorphous flower, in which the stamens and pistil differ in length and position, and the different stamens in the same flower have widely different degrees of fertility when applied to the same stigma; (2) in the case of the barberry, the irritable stamens of which spring up and dust pollen upon the insect that touches them; (3) in the case of others in which there are levers or processes by which the anthers are mechanically brought down upon the head or back of an insect entering the flower in such a position as to be carried to the stigma of the next flower it visits (*Salvia*, *leath*); (4) in plants which have sticky secretion as milkwort (*Polygala*), which gets on the tongue or proboscis of an insect, and is borne to the stigma of another flower; (5) in plants which have exploding anthers and other complex adjustments which thoroughly dust the insect, as in the pea family, e.g. *Medicago falcata*; (6) the entrapping of visitors in the spathes of *Arunum* and *Aristolochia*; and (7) in the traps of the flower of *Asclepias* and *Physianthus*, which catch flies, butterflies, and wasps by their legs; also the complex arrangements of orchids, described by Darwin in his *Fertilization of Orchids*. It appears that insects are attracted to those flowers which are largest and most gayly colored, the smaller, more inconspicuous not receiving so

many visitors. Bright-red flowers attract butterflies; blue flowers are especially attractive to bees, while dull-yellow or brownish flowers attract flies.

It has been thought by Darwin, Wallace, Lubbock, and others that the markings of flowers,



PURPLE LOOSESTRIFE.

Diagrams of three forms of flowers showing modifications of relative length of pistils and stamens in adaptation to requirements of cross-fertilization: A, long-styled form; B, mid-styled form; C, short-styled. (After Wallace.)

such as lines or spots converging to the centre or nectar, serve as guides to insects; but this is not necessarily the case, since salvia, wistaria, clover, and other flowers which are each of some one color attract bees equally well. H. Müller has observed that the gentians of the lowlands are visited chiefly by bees, while those of the high Alps are adapted only to butterflies. Most species of *Rhinanthus*, to which the 'yellow rattle' of Europe belongs, are what Wallace calls 'bee-flowers,' but one species confined to the high Alps of Switzerland has been adapted to be fertilized by butterflies only. It is now known that flowers did not appear until the Mesozoic age; they are not known to have existed in the Carboniferous period. Composite flowers, allied to the sunflowers, have been discovered in the Cretaceous clays of New Jersey, and it is probable that our large and irregular flowers possibly date back to the Cretaceous period. This was the time when insects that visit flowers also originated. No pollen-eating beetles, no moths, butterflies, wasps, or bees are known to have existed in the Carboniferous, nor before the middle or end of the Mesozoic; it seems probable, therefore, that flowers and the insects which visit them appeared at about the same epoch.

We may correlate with this view the theory of Henslow that the irregular flowers, such as those of the pea, bean, etc., are due to the intermittent mechanical stimulus resulting from the visits of butterflies, moths, and bees. He depends on the Lamarckian factors of use and dis-use, and use-inheritance, to account for the beautifully irregular forms of the papilionaceous and labiate flowers, as well as the singular and gorgeous flowers of the orchids, dispensing with the theory of natural selection. However this may be, in the beginning flowers were most probably small, regular in shape, inconspicuous, and self-fertilized. Henslow, and also Wallace, take the view that many inconspicuous and imperfect flowers, including those that are wind-fertilized, such as plantains, nettles, sedges, and grasses, do not represent primitive or undeveloped forms, but have, through the neglect of in-

sects, become degenerate types, derived from more perfect forms which were originally adapted to insect fertilization.

Fertilization of Flowers by Birds.—While in the north temperate zone insects appear to be the chief means of cross-fertilization of flowers, where this is not caused by the wind, in the tropics and Southern Hemisphere, Wallace tells us, birds have in many cases led to modifications in the form and colors of flowers. Humming-birds are active in performing this office, fertilizing many such blossoms as the passion-flowers, trumpet-flowers, fuchsias, and lobelias. The *Salvia splendens* of Mexico is especially adapted to their visits; and in the Andes and in Chile, where these birds are extremely abundant, many kinds of red tubular flowers, often of great size, are apparently adapted to the long, slender bills of these hummers. The most extraordinary adaptation to bird-fertilization are the flowers of *Maregravia*, in which, says Wallace, the pedicels and bracts of the terminal portion of a pendent bunch of flowers have been modified into pitchers which secrete nectar and attract insects, while birds feeding on the nectar or insects have the pollen of the overhanging flowers dusted on their backs, and carrying it to other flowers, thus cross-fertilizing them. In the eastern tropics the sunbirds take the place of the hummers, and they are aided by the flower-peckers. (See *DICUEUM*.) In the Australian region there are two flower-feeding groups—the honey-suckers (*Meliphagidæ*) and the brush-tongued lorries (*Trichoglossidæ*).

In New Zealand the use of animal life in fer-



CROSS-FERTILIZATION BY BIRDS.

A humming-bird (*Lophornis ornatus*) feeding upon a flower of *Maregravia nepentholides*, and taking and leaving pollen by brushing against the overhanging anthers and pistils.

tilizing flowers is seen in the case of a country which is remarkably poor in species of insects, especially bees and butterflies; yet it has been shown by local botanists that no less than one-fourth of all the flowering plants of those islands are incapable of fertilization, and thus wholly

dependent on animal life for the continuance of the species.

Advantages of Intercrossing.—This brief account of cross-fertilization of flowers shows, as pointed out by Darwin and others, that we probably owe to the visits of insects and birds the peculiar and varied forms and structures of our most beautiful and attractive flowers, and that as the result of intercrossing the size, height, vigor, and fertility of the race or species is enhanced. Yet with plants, as we shall see is the case with animals, the mere act of intercrossing by itself does no good. The good depends on the individuals which are crossed differing slightly in constitution, owing to their progenitors having been subjected during several generations to slightly different conditions.

Cross-Fertilization in Animals and Man.—Intercrossing in animals, as among plants, may, within due limits, be beneficial. These limits are confined to the same variety, race, or stock. If individuals of widely different races or breeds intermix, the result is degeneracy and sterility, the outcome of such unions being of the same nature as hybrids between different though allied species. As Darwin states: "After plants have been propagated by self-fertilization for several generations, a single cross with a fresh stock restores their pristine vigor; and we have a strictly analogous result with our domestic animals." This will apply to man also. When the French aristocracy was, as the result of the Revolution, broken up and forced to intermarry with the *bourgeoisie*, the result was an increase in the population and additional vigor in the race. An old family in its decline may be rejuvenated and restored by intermarriage with a more vigorous, even if a coarser, stock or strain. The population of our cities is maintained by the constant influx of fresh blood from the rural districts.

The mixture of the European races, now so marked, has been going on from early prehistoric (Neolithic) times. The French population is highly composite. The Anglo-Saxon race is equally or still more so, and the American people so in a still more marked degree; the intermixture being the result of emigration from the countries of northern and central Europe. It is not only that the old mixes with new stock, but the latter comes from regions differing in soil, climate, etc. Intermarriages between the stocks or breeds or strains of the white race are happy in their effects, resulting in increased vigor and fertility; and so with the stocks of the yellow, brown, or black races. The same law prevails throughout the animal world; everywhere Nature abhors too close inbreeding.

Interracial Marriage.—Miscegenation, or 'métissage,' is marriage between individuals of widely different races—i.e. a high and a low race or variety. Its effects are bad physically and morally, since the product, like mules or hybrids between species, is inferior to the higher though superior to the lower race; the result is that, when general, the higher race is pulled down, or tends to degeneracy, while the lower is in a degree elevated. Hybrids, or half-castes, are notoriously inferior to either pure race, though so partly from social causes. The results, so ap-

parent in human history, show that crosses are injurious between races too far removed in physical characters and constitution, or where living under remote climatic conditions. While marriages between black or other backward races and white races are markedly evil in their effects, unions between those nearer allied, such as those between the white race and the Japanese or the Polynesian or Malayan or North American Indian, also tend to result in sterility; on the other hand crosses between the yellow and brown races, and the brown and black, are apparently fertile, and the results not harmful.

In-and-in Breeding.—The deleterious effects of self-fertilization, or of marriage between blood-relatives, are recognized both by Darwin and by Wallace. Darwin found that certain plants which had been naturally cross-fertilized for many or all previous generations suffered to an extreme degree from a single act of self-fertilization. "Nothing of the kind," he adds, "has been observed in our domestic animals; but then one must remember that the closest possible interbreeding with such animals—that is, between brothers and sisters—cannot be considered as nearly so close a union as that between the pollen and ovules of the same flower."

Consanguineous Marriages.—The bearings of the previous statements on this important subject are obvious. Yet the matter is involved in doubt, authorities differing. The popular notion is that marriages between first cousins result in disease, idiocy, insanity, sterility, etc. That the results are not, however, always deleterious is a matter of frequent observation. Darwin refers to his son's (G. H. Darwin) attempt to discover by a statistical investigation whether the marriages of first cousins are at all injurious, "although this is a degree of relationship which would not be objected to in our domestic animals." It appears from these and other researches that "the evidence as to any evil thus caused is conflicting, but on the whole points to its being very small." He concludes "that with mankind the marriages of nearly related persons, some of whose parents or ancestors had lived under very different conditions, would be much less injurious than that of persons who had always lived in the same place and followed the same habits of life. Nor can I see reason to doubt that the widely different habits of life of men and women in civilized nations, especially among the upper classes, would tend to counterbalance any evil from marriages between healthy and somewhat closely related persons."

Finally, to sum up the results thus far obtained, it appears, as concluded by Wallace, that a slight amount of crossing, attended by slight changes of the conditions of life, is beneficial; while extreme changes and crosses between individuals too far removed in structure or constitution are injurious.

BIBLIOGRAPHY. Hermann Müller, *The Fertilization of Flowers* (Eng. trans. London, 1883); Wallace, *Darwinism* (London, 1889); Darwin, *Various Contrivances by Which Orchids Are Fertilized by Insects* (2d ed., London, 1877); *Effects of Cross and Self Fertilization in the Vegetable Kingdom* (2d ed., London, 1878); *Different Forms of Flowers on Plants of the Same Species* (2d

ed., London, 1880); *Descent of Man* (2d ed., London, 1874); Henslow, *Origin of Floral Structures* (London, 1893); Wallace, *Malay Archipelago* (New York, 1869); Lubbock, *British Wild Flowers Considered in Relation to Insects* (4th ed., London, 1882); Grant Allen, *On the Colors of Flowers* (London, 1880); Belt, *A Naturalist in Nicaragua* (London, 1888); Forbes, *A Naturalist's Wanderings in the Eastern Archipelago* (New York, 1885).

CROSS-FOX. A valuable variety of the American red fox, marked by a dark line along the back, crossed by one upon the withers, whence the name. See FOX.

CROSS KEYS. A post-village in Rockingham County, Va., about 20 miles northeast of Staunton. Here, on June 8, 1862, during the Civil War, an indecisive engagement occurred between 18,000 Federals, under General Frémont, and a part of Jackson's retreating army, numbering about 8000, under General Ewell, the latter withdrawing during the night to effect a junction with Jackson. Each side lost about 500. The engagement was a strategic success for the Confederates, in that it checked the pursuit of Frémont and prevented his joining with General Shields for a combined attack.

CROSSLEY, SIR FRANCIS (1817-72). An English philanthropist, born at Halifax, Yorkshire. He succeeded to the proprietorship of the Dean Clough carpet-mills, and accumulated a vast fortune. His many benefactions included the gift to Halifax of twenty-one almshouses and an endowed public park, and to the London Missionary Society of £20,000. He was created a baronet in 1863, and published a lecture, *Canada and the United States*, in 1865.

CROSSOPTERYGII, *krōs-sōp'tēr-ij'i-i* (Neo-Lat. nom. pl., from Gk. *κροσσοί, krossoi*, fringed + *πτερυγιον, pterygion*, diminutive of *πτερυξ, pteryx*, wing). An order of ganoid fishes, numerous in former ages, but surviving only in the ganoid-like genera *Polypterus* (see BICHR) and *Calamioichthys*. They are described as "Teleostomi, in which the pectoral fin consists of a rounded basal lobe, supported by endoskeletal structures and fringed by dermal rays. There are no branchiostegal rays. The vertebral column is well ossified, and the caudal fin is diphycceral. The pelvic fins are abdominal. A spiral valve and a conus arteriosus are present and the optic nerves form a chiasma."

CROSS RIVER. See CALABAR.

CROSWELL, *krōz'wēl*, EDWIN (1797-1871). An American journalist, long prominent in Democratic politics as a member of the Albany Regency (q.v.). He was born at Catskill, N. Y., began his journalistic career on the *Catskill Recorder*, a journal established by his father, and in 1824 became editor of the *Albany Argus*, which he made the official organ of his party in the State. He was also State printer from 1824 to 1840, and from 1844 to 1847. Croswell was the great antagonist of Thurlow Weed and exerted powerful influence by his editorial utterances in both State and national politics.

CROSWELL, HARRY (1778-1858). An American journalist and clergyman, born at West Hartford, in Connecticut. In 1802 he became

editor of the *Balance*, a Federalist newspaper, at Hudson, N. Y., and later of the *Wasp*, a libelous sheet which involved him in numerous lawsuits, the most important of which resulted from an attack upon Thomas Jefferson. His defense by Alexander Hamilton was the last forensic effort of that great lawyer. In 1814 he took orders, and in 1815 became rector of Trinity Church, New Haven, Conn. He was the author of *The Young Churchman's Guide; Manual of Family Prayers* (1837); and *Guide to the Holy Sacrament* (1867).

CROT'ALA'RIA (Neo-Lat. nom. pl., from Gk. *κρόταλον, krotalon*, rattle). A genus of plants of the natural order Leguminosae, deriving its name from the inflated pods in which the seeds rattle when ripe. The species are numerous; annual, perennial, and shrubby plants, natives of the temperate and tropical parts of the world. Many of them have long, straight, slender stems and branches, and some of these yield valuable fibre, particularly the *Sunn* (q.v.), or *Sunn hemp* of India, *Crotalaria juncea*, an annual species, the fibre of which is now an important article of commerce. *Jubbulpore hemp*, also an important fibre, and regarded as stronger than *Sunn*, is the produce of *Crotalaria tenuifolia*, usually considered a variety of *Crotalaria juncea*, a perennial species about nine feet high, a native of the south of India, which, when growing in abundant space, throws out many branches; but when sown thick, grows with little branching. *Crotalaria burbia*, which naturally grows in very arid places, is also cultivated in Sindh for its fibre. There are a dozen species native of the United States, one of which, *Crotalaria sagittalis*, and perhaps others, are reputed to be injurious to horses, causing what is termed 'crotalism,' a disease something like *loeo* (q.v.).

CROTAL'IDÆ (Neo-Lat. nom. pl., from Gk. *κρόταλον, krotalon*, rattle). A family of venomous serpents, the pit-vipers, viper-like in form, but distinctively characterized by the presence of a deep pit on each side of the face between the nostril and the eye. It includes the American rattlesnakes, moccasins, and copperheads, and some Asiatic species. See RATTLESLAKE.

CROTALISM. See CROTALARIA.

CROTAPH'YTUS. See COLLARED LIZARD.

CROTCH, WILLIAM (1775-1847). A distinguished English composer, born at Norwich. He was quite as precocious as Mozart. When little more than three years old he could play "God Save the King" almost throughout with chords, and could detect in a moment what note was struck and in what key music was composed. When only twenty-two Crotch was appointed professor of music in Oxford University, and the degree of doctor of music was conferred upon him. In 1822 he obtained the principalship of the Royal Academy of Music. He composed much for the organ and piano, as well as many vocal pieces. Among the last, the oratorio *Palestine*; an ode, "Mona on Snowdon Calls;" a glee, "Nymph, with thee;" and a motet, "Methinks I hear the full celestial choir," are still popular. His most important book was *Elements of Musical Composition and Thorough-Bass* (1812). He died at Taunton, England.

CROTCHET CASTLE. A novel by Thomas Love Peacock (1831). The story is only a thread serving to connect a series of amusing satires on the learned foibles of the day. The scene is laid at Crotchet Castle, the country home of Ebenezer MacCrotchet, where a company of oddities are gathered. The strongest character is Doctor Folliot, a combative clergyman, full of antipathies and classical quotations.

CROTON (Neo-Lat., from Gk. κροτών, κρότων, *krotōn*, tick, shrub bearing the castor-berry, which was thought to resemble a tick). A genus of plants of the natural order Euphorbiaceæ. The species are numerous, mostly tropical or sub-tropical trees or shrubs, a few herbaceous. Some of them possess in a very high degree the acrid properties so characteristic of the order to which they belong. Among these, the most important is the purging croton (*Croton tiglium*), a small tree, a native of India and the more easterly tropical parts of Asia. The leaves are extremely acrid; the wood in a fresh state is a drastic, and in a dried state, a more mild purgative; and the seeds (*croton seeds* or *tilly seeds*) are an extremely powerful drastic purgative, formerly much employed in Europe, but latterly dis-used on account of violence and uncertainty of action, although still valuable as yielding croton oil (q.v.). They are oval, or oval-oblong, about the size of field-beans. The oil is obtained mostly by expression, and partly by treating the cake with alcohol. Other species possess similar properties. Very different properties are found in the species which yield cascarrilla (q.v.) and eopalehe (q.v.) barks, to which a great resemblance exists in the barks of a number of species, natives chiefly of South America. Other species are still more aromatic, and some delightfully fragrant, containing in great abundance a thickish, balsamic sap. The sap of *Croton gratissimus* is much employed as a perfume and cosmetic at the Cape of Good Hope; that of *Croton originifolius* is used in the West Indies as a substitute for balsam of copaiva; that of *Croton flavens*, also West Indian, furnishes *cau de Mantes* by distillation; and the balsamic sap of some South American species is dried and used as incense. *Croton lacciferus*, which grows abundantly in Ceylon, is an important lac-tree. There are quite a number of species in the United States, chiefly in the Southwest, but they have little economic value. The plants extensively cultivated by florists in hot-houses as crotons belong to the genus *Codiaeum*. They have very curious and often highly colored leaves.

CROTONA, or **CROTON** (Lat., from Gk. Κρότων, *Krotōn*). A Greek colony in south Italy, on the east coast of Bruttium, founded probably about B.C., 700, by Achæans. Situated near a good harbor and in a fertile territory, Crotona rapidly became wealthy, and was famous for its Olympian victors, especially the great athlete Milo, who is said to have led the army in the war with Sybaris. About B.C. 530 the city became the home of Pythagoras (q.v.), and the Pythagorean brotherhood the rulers of the city. But soon after the destruction of Sybaris (B.C. 510) a reaction set in and the Pythagoreans were expelled. The power of Crotona sank rapidly during the fifth and fourth centuries B.C. It was captured by Dionysius the Elder of Syra-

cuse, and later by Agathocles, and in the war between Pyrrhus and the Romans was plundered and nearly destroyed. It recovered somewhat, but suffered severely in the Second Punic War, and, though made the seat of a Roman colony in B.C. 194, was never after a place of importance. The modern name is Cotrone.

CROTON AQUEDUCT. See **AQUEDUCT** for descriptions of both the old and the new Croton Aqueduct.

CROTON BUG. See **COCKROACH**.

CROTON EL'EUTE'RIA. See **CASCARILLA**.

CROTON OIL. The fixed oil obtained by expressing the seeds of the *Croton tiglium*, cultivated in India and the Philippine Islands. It is a viscid liquid varying in color from a pale yellow to a reddish brown or deep sherry. It is insoluble in water and but sparingly soluble in alcohol, ether, carbon disulphide, and many other organic solvents. It has an acrid taste and an unpleasant fatty odor. It contains *tiglinic acid*, $C_{11}H_{20}O_2$, *crotonol*, $C_{15}H_{24}O_4$, and the glycerides of several fatty acids. Croton oil is a powerful irritant. When rubbed upon the skin it produces rubefaction and pustular eruption. It is now rarely used in medicine, being prescribed for the purpose of stimulating the skin in alopecia, and internally to relieve very obstinate constipation.

CROTON RIVER. A river of New York, rising in Dutchess County. It flows southwest through Putnam and Westchester counties, and empties into the Hudson River (q.v.) just above Sing Sing, and 30 miles above New York City. The Croton River is about 60 miles in length, drains an area of 340 square miles, and in its basin are fifteen storage lakes and ponds which furnish the chief part of the water-supply of New York City.

CROTUS RU'BIA'NUS. The assumed name of JOHANNES JÄGER (c.1480-c.1540). A German humanist, born at Dornheim, Thuringia. Next to Ulrich von Hutten, he was the most important contributor to the famous *Epistolæ Obscurorum Virorum* (q.v.).

CROUCH, **FREDERICK NICHOLLS** (1808-96). An Anglo-American musician, born in London. He came of a musical family, and was himself remarkably precocious. He studied at the Royal Academy of Music and with Boehm, and when only nine years old was a cellist in the Royal Coburg theatre. Subsequently he was in the orchestras of Queen Adelaide and at Drury Lane theatre, after which he became a teacher and singer in Plymouth. In 1849 he came to the United States, acting in various capacities as musical director, teacher, and chorister. During the Civil War he served in the Confederate Army, and upon its close, having lost all his books and manuscripts, became a gardener at Buckingham Court-house. Through the kindness of his old army comrades he was enabled to re-establish himself as a teacher. He died in Portland, Maine. His compositions were almost exclusively songs, and comprise "Kathleen Mavourneen;" "The Soldier's Grave;" "The Emigrant's Lament;" "Twenty Years Ago;" and "Friendship," all of which became extremely popular.

CROUP (Scotch *croupe*, *crope*, to croak, make a harsh noise). Since the discovery of the

cause of diphtheria, it has been found that there are two forms of disease formerly known as croup: (1) false croup, and (2) membranous croup, which is diphtheria of the larynx. False croup is caused in feeble or ill-fed children, or in those who have a catarrhal tendency, by exposure to cold and wet, digestive disturbances, or, in some cases, the grippe (q.v.). The child has a running from the nose and a cough; he awakens coughing hoarsely, with noisy and labored breathing or gasping, with every appearance of suffocation, the face becoming red or purplish, and tears starting from the eyes. The attack lasts from a half hour to five or six hours, and then relief comes in a loose cough, abatement of the fever, and free perspiration. The attack may be repeated on succeeding nights. No membrane is coughed up. The treatment consists of inhalation of warm, moist air from a tea-kettle placed under a sheet thrown over the child's bed; frequent draughts of warm milk; and a dose of a half-teaspoonful of syrup of ipecac, repeated every fifteen minutes till vomiting occurs once. Other drugs should be prescribed by a physician.

Membranous croup is caused by the bacillus of diphtheria (q.v.), or by streptococcus, and is very dangerously contagious as well as largely fatal. The symptoms are much the same as in false croup, except that the child is generally drowsy for a few hours before the difficulty in breathing and the cough begin, and after a time becomes exceedingly restless, the lips and face become blue, pieces of membrane are coughed up, coma and possibly convulsions follow, and death occurs unless relief is obtained. Relief from suffocation may be obtained by the use of the tracheotomy tube. This is a metal or hard rubber tube inserted into the windpipe below the larynx by a surgeon, through an incision in the neck; or by the use of the intubation tube invented by Dr. Joseph O'Dwyer, of New York, which is passed down the throat and between the vocal cords, and fastened in place. These procedures do not, however, check the disease. See DIPHTHERIA.

CROW (AS. *crowe*, OHG. *chruwa*, *chruja*, Ger. *krähe*, crow, from AS. *cravan*, OHG. *chrujan*, Ger. *krähen*, to crow; probably onomatopoeic in origin). A bird of the genus *Corvus*, the type of the family Corvidæ. The crows are a widely distributed group of birds, found in nearly all parts of the world, but especially in the Northern Hemisphere. The largest species of the genus is the raven; the rook and the jackdaw of England also belong to it. Crows are always more or less black, frequently wholly so, but differ from each other not only in color, but especially in size and in the amount of space at the base of the bill, which is bare of feathers. All are smaller than the raven, but are mostly more than fifteen inches in length. They are omnivorous, eating almost anything edible, and some species live largely on fish. All are intelligent to a high degree, and many stories are current regarding their avoiding danger and communicating with each other. They are easily domesticated. Most of the species are more or less gregarious, at least at certain seasons of the year, and frequently resort in incredible numbers to certain favorite places of woodland to roost at night.

Three species of crow occur in the United States, besides the two ravens. The common crow (*Corvus Americanus*) is generally distributed over North America, but is most abundant in the East, and is apparently wanting from certain parts of the Rocky Mountain region, where ravens are common. Although it formerly had a bad reputation as a corn thief, and is known to be guilty not only of stealing corn, but even of stealing eggs and killing birds (including poultry), yet it is now recognized as a really beneficial bird and a true friend of the farmer, because of the vast number of injurious insects which it destroys. It was primitively confined mainly to the Eastern coast-belt, but has steadily progressed westward with the advance of civilization, as the raven has correspondingly disappeared.

The fish-crow (*Corvus ossifragus*) frequents the coast and the Southern rivers of the United States. (See FISH-CROW.) The 'jabbering' crow (*Corvus Jamaicensis*) of the Blue Mountains of Jamaica is remarkable for the resemblance of its voice to human speech, which some of the other species of this genus may be taught to imitate. The small, glossy crow of India and Ceylon (*Corvus splendens*) frequents the towns, feeding on offal, and boldly entering rooms through open windows to snatch some morsel from the dinner-table; these birds, called hooded crows in English India, are a nuisance by their boldness and thievish ways about camps and villages.

CROW (translation of the Hidatsa name of the tribe *absaroka*, hawk). A warlike and predatory tribe of Sioman stock, formerly roaming over the upper Yellowstone region of Wyoming and Montana and now gathered upon a reservation in the latter State to the number of about 1950. They were formerly almost constantly at war with all their neighbors, particularly the Sioux, but have uniformly remained at peace with the whites, frequently furnishing a contingent of scouts against the hostile tribes.

CROWBERRY, or **CRABERRY** (so called from its black color) (*Empetrum nigrum*). A small procumbent shrub, of the natural order Empetraceæ, a native of the northern parts of the world, abundant in the moors and highlands of all high latitudes. The order consists of a few heath-like shrubs. The berries of the crowberry are nearly black, surround the branches in crowded clusters, and each contains six to nine bony seeds and a watery, acidulous juice, which is sometimes thought to be refreshing; but they are generally little esteemed. A fermented or vinous liquor is prepared from them in some northern countries. They are a favorite food of game. A variety, *rubrum*, said to be a native of the vicinity of Cape Horn, differs little from the northern plant, except in having red berries.

CROW-BLACKBIRD. See GRACKLE.

CROWD (AS. *croda*, *geerod*, throng; of unknown origin), or **MOU**. In the popular sense, an aggregation of individuals, regardless of their character or the purposes which brought them together. The psychological signification of a crowd is different. The aggregation becomes a crowd only "when the sentiments and ideas of all the persons in the gathering take one and the same direction, and their conscious personality

vanishes." A half-dozen individuals gathered together may become a crowd more easily than hundreds assembled accidentally.

The most distinctive characteristic of a crowd is that the individuals composing it do not think and act as each one would think and act independently. Back of the avowed causes of our acts are unconscious motives or forces that defy investigation, and these are the mainsprings of crowd activity. They are the common characteristics of the race, and it is in these points that people are more alike than in the acquired characteristics which result from education. It is owing to the fact that these forces which are requisite for crowd or mob activity are the primitive ones, that crowds are incapable of rising above very mediocre intellectual attainments. This also explains why the crowd descends in the scale of civilization below the average individuals composing it. If this were not true, it would be impossible to explain the conduct of otherwise respectable people at lynchings and the degrading forms of torture imposed by them.

The causes which determine the appearance of the characteristics of the crowd are: (1) a sentiment of invincible power; (2) suggestion; and (3) contagion. Through the mere force of numbers, and also through the irresponsibility of the individual of the crowd, a feeling of invincible power takes possession of him. Nothing is permitted to stand between him and the realization of his aims. On this account the soldier in battle, acting under a common impulse, is braver and stronger than he would be otherwise. By means of suggestion, contagion in the crowd is produced; the individuals are more or less in a hypnotic state; and the individual will and personality disappear in a common purpose or aim.

Crowds are not premeditative; they are impulsive and mobile. Aroused one minute to acts of generosity and heroism, they may descend the next to acts of extreme violence and torture. They are credulous, believing things wholly incomprehensible to those outside of crowd influence.

Much difference of opinion prevails concerning the rôle which mob action is to play in the civilization of the future. Gustave Le Bon, *The Crowd* (Eng. trans. London, 1900), asserts that "while all our ancient beliefs are tottering and disappearing, while the old pillars of society are giving way one by one, the power of the crowd is the only thing that nothing menaces, and of which the prestige is on the increase. The age we are about to enter will in truth be the era of crowds." Professor Baldwin, *Social and Ethical Interpretations* (New York, 1897), differs widely from this point of view, claiming that "the attempt to build a fruitful conception of society upon the actions of the crowd under the influence of these imitative suggestions, seems to be crude and unphilosophical in the extreme." See SOCIOLOGY; SOCIAL PSYCHOLOGY.

CROWD, CROUTH, or CRWTH (from Welsh *crwth*, Gael. *cruit*, OFr. *crot*, violin; ultimately identical with Welsh *crwth*, bulge, on account of the rounded shape of the instrument). A musical bow instrument, of Welsh or Irish origin, and probably the oldest European instrument of that class. It is mentioned as a *chrotta* by Venantius Fortunatus in 609, and from then

till the beginning of the nineteenth century, when it was still in use, seems to have preserved its form. Originally its body was square and was prolonged by two parallel arms, connected at the end by a cross-bar. From this bar a narrow finger-board extended to the middle of the sound-box. The strings, originally three, later six in number, were stretched from the top of the parallel arms to the bottom of the sound-box and were supported by a bridge placed between two sound-holes. For illustration, see MUSICAL INSTRUMENTS.

CROWDE'RO. A fiddler and leader of a rabble met by Hudibras in Butler's *Hudibras*.

CROW-DUCK, or SEA-CROW. A eoot.

CROWE, krō, CAPTAIN. In Smollett's *Sir Launcelet Greaves*, the captain of a merchant vessel, who becomes Sir Launcelet's squire on his journeys as a knight errant.

CROWE, CATHERINE (c.1800-76). An English author. She was born at Borough Green, Kent, and lived chiefly in Edinburgh. Her principal work, entitled *The Night Side of Nature* (1848), has perhaps never been surpassed for weirdness of conception. In her novels, among which may be cited *Adventures of Susan Hopley* (1841) and *Lilly Dawson* (1847), she showed much skill and ingenuity in the development of the plot.

CROWE, EYRE (1824—). An English painter, born in London. He was a pupil of Paul Delaroché in Paris, traveled in the United States as amanuensis to Thackeray in 1852-53, and was elected an associate of the Royal Academy in 1876. He was also appointed an inspector of the science and art department of the South Kensington Museum. His pictures include "Goldsmith's Mourners" (1863), "Friends" (1871), "The Rehearsal" (1876), "Forfeits" (1880), "The Brigs of Ayr" (1894), "The Gipsy's Rest" (1897), and "James II. at the Battle of La Hogue" (1898). He published *With Thackeray in America* (1893).

CROWE, JOSEPH ARCHER (1825-96). An English journalist. He was born in London and began his journalistic career as foreign editor of the *Daily News*. During the Crimean War he was the correspondent of the *Illustrated London News*, and he acted in the same capacity for the *Times* during the Indian Mutiny. While in India he was also director of the Art School at Bombay from 1857 to 1859. In the following year he became Consul-General at Leipzig, and in 1870 he was again correspondent of the *Times* during the Franco-German War. He thereafter became Consul-General at Düsseldorf (1878); secretary and protocolist to the Danubian Conference, London (1883); and British Plenipotentiary to the Samoan Conference, Berlin (1889). He collaborated as co-editor with G. B. Cavalcaselle (q.v.).

CROWELL, krō'el, EDWARD PAYSON (1830—). An American scholar and educator, born at Essex, Mass. He graduated at Amherst College in 1853, at Andover Theological Seminary in 1858, and in 1859 was licensed to preach by the Congregational Church. From 1858 to 1864 he was instructor in German and professor of Latin at Amherst. In 1864 he was appointed to the chair of Latin languages and literature, and in 1880-94 was dean. He was also elected a Representative in the State Legislature of

Massachusetts in 1879. He was a charter member of the American Philological Association, and received the degree of D.D. from Williams College in 1882. His publications include, in addition to contributions to periodical literature, numerous scholarly editions of Latin classics, such as those of (1871) the *De Senectute* and *De Amicitia*; (1873) the *De Officiis*; (1874) the *Andria* and *Adelphæ*; and (1879) the *De Oratore*. He also translated and edited Bendor's *Grundriss der römischen Litteraturgeschichte* (1876) under the title, *a Brief History of Roman Literature* (1880); jointly with H. B. Richardson, prepared a useful volume of *Selections from Latin Poets*, with notes (1882); and wrote *A Clue to the Prose Writings of the Silver Age* (1897).

CROWFIELD, krō'fild, CHRISTOPHER. A name which Mrs. Harriet Beecher Stowe sometimes used as a pseudonym.

CROWFOOT. See RANUNCULUS.

CROWFOOT FAMILY. See RANUNCULACEÆ.

CROW-GARLIC. See ALLIUM.

CROWLEY, krō'li. A town and county-seat of Aeadia Parish, La., 166 miles west of New Orleans, on the Southern Pacific Railroad. Its principal industries are the cultivation of rice and rice-milling. Oil in paying quantities has been discovered in the vicinity. Settled about 1887, Crowley was incorporated two years later, and has enjoyed a rapid growth. The government is administered by a mayor, elected every two years, and a council chosen on a general ticket. The town owns and operates its water-works and electric-light plant. Population, in 1890, 420; in 1900, 4214.

CROW-PHEASANT, fēz'ant. See COUCAL.

CROWN (MDutch *krone*, *krone*, Jecl. *krūna*, Ger. *Krone*, OHG. *corōne*, *corōna*, OF. *corone*, Fr. *couronne*, from Lat. *corona*, crown, Gk. *κορώνη*, *korōnē*, curved end of a bow; connected with Gael. *crúinn*, Welsh *crwn*, round, Lat. *curvus*, curved). The crown, as we understand it to-day, resembles in some degree the fillets, wreaths, and garlands which were worn among the Greeks as an emblem of office (in the case of the archons), as a distinction for the victors in the public games, or for citizens who had rendered exceptional service to their country. The Romans used them chiefly as rewards for valor. The most highly prized was the *corona obsidionalis*, made of grass or wild flowers, bestowed by a beleaguered garrison on the general who rescued them. Next came the *corona civica*, of oak-leaves and acorns, as a reward to any soldier who had saved the life of a Roman citizen in battle; a place next to the senators was reserved for the wearer at public spectacles, and the whole assembly rose at his entrance. The *corona muralis*, a golden ring surmounted with turrets or battlements, was bestowed on the man who first scaled the wall of a besieged city; and the *corona triumphalis*, of three kinds, upon a general who obtained a triumph. There were other crowns not honorary, but emblematical, and regulated not by law as were the former ones, but by custom. Of these the most important were the *corona sacerdotalis*, worn by priests and others engaged in sacrifice; *corona funebri*, or *sepulchralis*, with which the dead were crowned;

corona convivalis, worn on festive occasions by banqueters; *corona nuptialis*, or bridal wreath; and *corona natalitia*, a chaplet suspended over the door of a house in which a child was born.

As the emblem of sovereignty in modern Europe the crown was borrowed rather from the diadem (q.v.) than from the above-mentioned crowns. The Roman emperors are represented as wearing either the diadem, the laurel crown (a simple emblem of glory), or the radiating crown, probably of Eastern origin, which symbolized among the Romans the deification of the emperors. From the time of Constantine the Great (306-337) the diadem was the established emblem of imperial power; but it was supplanted under Justinian (527-65) by the crown called *stemma*, a slight elaboration upon the golden fillet; and this in turn was replaced by still more elaborate crowns, until the crown with arches became the accepted form. The ordinary type of the imperial crown of the Middle Ages, as assumed in imitation of the Greek emperors by Charles the Bald (840-77), is found in an illuminated MS. at Munich representing the Emperor Henry II. (1002-24) crowned by Christ. The crown actually used at the coronation of many subsequent emperors, and now preserved in the imperial treasury in Vienna, is a round cap surrounded by eight small shields with semicircular tops alternately adorned with precious stones and with pictures. It is surmounted by a small cross resting on an arch inscribed "Chonradus Dei gratia Romanorum imperator augustus" (Conrad II., 1024-39). The present Austrian imperial crown is of the style adopted by the Emperor Maximilian II. in 1570; it is cleft in the centre so as partly to resemble a mitre; the golden circlet is jeweled and adorned with fleurs-de-lis and surmounted by a cap, above which rises a single arch surmounted by a cross. The new German imperial crown resembles the old crown of Charlemagne and consists of eight shields ornamented with precious stones; the larger shields show a cross made of precious stones, the smaller the imperial eagle set with diamonds; above it rise four arches surmounted by a cross. The royal crown of Great Britain is a circle of gold enriched with precious stones and pearls, and heightened by four crosses patée and four fleurs-de-lis alternately; from these rise four arches which close under a mound ensigned with a cross patée. See TIARA; CORONET.

So entirely was the crown regarded as the symbol of sovereignty that the word came to be used as synonymous with the monarchy, the State, and matters under the control of the executive authority; thus we speak of Crown lawyers, Crown lands, etc., the term having no connection with the sovereign personally.

CROWN, ORATION ON THE. See DE CORONA.

CROWN DEBTS. In English law, all debts due to the Crown, which are on record, or evidenced by a bond or other specialty, and also those due from accountants to the Crown on account of moneys received for the use and benefit of the Crown. Formerly the lands of the debtor were subject to a lien for the amount due, even in the hands of an innocent purchaser for value without notice of the lien, if they were conveyed after the debt became due. At present the lien is not binding on a *bona fide* purchaser

or mortgagee for value, unless a writ of execution has been issued and registered before the execution of the mortgage or conveyance.

Simple contract debts have no such lien; but the Crown has in all cases preference over private creditors in the distribution of the estates of bankrupts and deceased persons. See ADMINISTRATION: DEBT; PREROGATIVE; EXCHEQUER. Consult Prideaux, *Law of Judgments and Crown Debts, as They Affect Real Property* (4th ed., London, 1854).

CROWN DIAMONDS, THE. The English version of Auber's *Les diamants de la couronne* (1844).

CROWNE, JOHN (c.1640-c.1703). An English dramatist. He began his literary career with *Pandion and Amphigenia* (1665), interesting as one of the very few English heroic romances in imitation of Scudéry. His contemporary reputation as dramatist was gained by *The Destruction of Jerusalem*, in two parts (produced in 1677). His comedy *Sir Courtly Nice* (produced in 1685) held the stage through the eighteenth century. His numerous other plays have only slight interest. Consult *Dramatic Works* (4 vols., Edinburgh, 1873).

CROWN-GALL. A very destructive disease that attacks nearly all kinds of fruit-trees, grapes, almonds, walnuts, blackberries, raspberries, poplars, and chestnuts, frequently killing them. The point of attack is at the crown of the roots where the roots and stem join, the galls formed on young trees being half an inch or more in diameter. Usually occurring at the crown, the galls are sometimes found upon the slender roots of nursery trees. When young they have the color of the young roots, but later they are considerably darker. They increase with the age of the tree, becoming as large as a man's fist or even larger. When small they are soft masses of irregular fibres, and when older they exhibit concentric rings in cross-section. On account of the deep wounds made by the fungus and the attack made upon the vitality of its host the tree is frequently killed, and whole orchards are reported in which every tree has succumbed to this cause. The disease is widely distributed, being known in Europe, in many parts of the United States, and recently reported from New Zealand. The cause is a low fungus or myxomycete to which the name *Dendrophagus globosus* has been given. It is closely related to the cause of the club-root of cabbage and allied plants. Annual inspection of the trees, cutting off all galls and coating the cut surfaces with a paste made of copper sulphate and lime, is the most efficient protection known.

CROWN GLASS (so called because of its crown-like shape when being blown). A soda-lime glass chiefly used for the manufacture of window-panes. In England it is usually made from 12 parts silica, 13 parts soda, 13 parts lime, and 2 parts iron and alumina oxides, while elsewhere it frequently contains more silica and less soda. See GLASS.

CROWN and **HALF-CROWN** (so called from the crown which generally appears on the reverse). English silver coins since 1551. Before that date they were made of gold. The crown, which is the five-shilling piece, is worth approximately \$1.20 in United States currency.

CROWN IMPERIAL. See FRITILLARY.

CROWN INSHIELD, ARENT SCHUYLER (1843—). A United States naval officer, born in New York. He graduated at the United States Naval Academy in 1863, was a participant in both of the attacks on Fort Fisher (December, 1864, and January, 1865), and in 1868 attained the rank of lieutenant-commander. His further promotions were to be commander in 1880, captain in 1894, and rear-admiral in 1897. He became chief of the Bureau of Navigation of the Navy Department in 1897, and during the Spanish-American War was a member of the Board of Naval Strategy. He immediately preceded Capt. H. D. Sigsbee in the command of the battleship *Maine*.

CROWNINSHIELD, FREDERIC (1845—). An American painter and writer, born in Boston, November 27, 1845. He graduated at Harvard College (1866), after which he married and went abroad, where he remained eleven years. He studied under Rowbotham in London, Couture in Italy, and Cabanel in Paris. He returned to America, and from 1879 to 1885 was an instructor in the Museum of Fine Arts in Boston. He published a volume of verse entitled *Pictoris Carmina*, in 1900, and has written a handbook on the processes of mural painting.

CROWN LANDS. The English sovereign was at one time not only the nominal owner, as lord paramount, of all the lands in England, but was also in his royal capacity one of the greatest landowners in the kingdom. He was, by virtue of his office, the lord of many manors, and in him were vested the wastes, forests, and common lands throughout the realm. The ancient demesne lands of the Crown are now contracted within narrow limits, having been almost entirely granted away to subjects. King William III. so impoverished the Crown in this manner that an act was passed, 1 Anne, c. 7, § 5, the effect of which and of subsequent statutes is that all grants or leases from the Crown of royal manors, or other possessions connected with land, for a period exceeding thirty-one years, are void. At a much earlier period (1455, c. 41), a Scottish statute had rendered the consent of Parliament necessary to the alienation of the property of the Crown; but neither it nor the subsequent statutes which were passed with a similar object succeeded in checking the practice. Since the beginning of the reign of George III., the English sovereign surrenders during his life the hereditary revenues derived from the Crown lands in exchange for a fixed civil list granted by Parliament. The superintendence of such property as still belongs to the Crown is now vested in commissioners appointed for that purpose, called the commissioners of woods, forests, and land revenues. These restrictions do not apply to estates purchased by the sovereigns out of the privy purse, or coming to the sovereign, his heirs, or successors, by descent or otherwise, from persons not being kings or queens of the realm; for, although there is no marked line drawn between the proprietary rights which the King has as King and those which he has in his private capacity, and there are no lands which belong to the nation or State as a personified body, yet a distinction is made between the lands of ancient demesne and those coming by modern title, by which the alienation of the former is restricted and that of the latter left free. Consult: Cox, *Institu-*

tions of the English Government (London, 1863); Stephen, *New Commentaries on the Laws of England* (13th ed., London, 1899). See FEUDALISM.

CROWN POINT. A town and the county-seat of Lake County, Ind., 40 miles southeast of Chicago, Ill., on the Chicago and Erie, and the Pittsburg, Cincinnati, Chicago and Saint Louis railroads (Map: Indiana, B 1). It has grain-elevators, machine-shops, wagon-works, broom-factories, and a shirt-factory. Population, in 1890, 1907; in 1900, 2336.

CROWN POINT. A town in Essex County, N. Y., on the west shore of Lake Champlain, and on the Delaware and Hudson Railroad, 110 miles north by east of Albany (Map: New York, G 2). It contains the Hammond Library. The town has manufactures of building material, lumber, and staves; and in the vicinity are deposits of iron ore, which, however, are not worked at present. Population, in 1890, 3135; in 1900, 2112. Crown Point was originally an English trading-station. About 1731 the French built upon the site Fort Saint Frederick, which, in spite of hostile English expeditions directed against it in 1755 and 1756, they held until 1759, when the garrison joined that of Ticonderoga (q.v.) and retreated down the lake. General Amherst then took possession, and, during the winter of 1759-60, began work on fortifications, the ruins of which still remain, and which, though never completed, ultimately cost fully \$10,000,000. On May 11, 1775, Seth Warner, at the head of a company of 'Green Mountain Boys,' captured the fort, then garrisoned by only twelve men. In 1777, on the approach of General Burgoyne, it was temporarily abandoned by the Americans.

CROWN SOLICITOR. The solicitor to the treasury, who, in State prosecutions in England, acts as solicitor for the Crown in preparing the prosecution. In Ireland there are Crown solicitors attached to each circuit, whose duties correspond in some degree to those of the procurator-fiscal and Crown agent in Scotland. In England, there are no analogous officers, and prosecutions are conducted by solicitors appointed by the parish, or by private parties.

CROW'QUILL, ALFRED. See FORRESTER, ALFRED HENRY.

CROW'S-NEST. A perch for the lookout man of a vessel. It is placed on the foremast at as great a height above the deck as is found desirable; protection from the weather is afforded by a platform surrounded by canvas.

CROWTHER, SAMUEL ADJAI (1810-91). The first native bishop of Africa, born in the Yoruba country. He was captured in a slave raid when but a lad, and was several times sold. He was finally shipped on a Portuguese slaver, from which he was rescued by a British man-of-war, and was placed in the mission school at Bathurst. He was the first student enrolled in the Fourah Bay College, where he subsequently served as an assistant instructor. Ordained in 1843, he became a missionary at Akessa. In 1864 he was consecrated bishop of the Niger country. Crowther accompanied both of the British Niger expeditions, a journal of which he published. His other works include a dictionary of the Yoruba language and a translation of the Bible into the Yoruba.

CROY'DON (OEEngl. *Croidenc*, from Fr. *creta*, lt. *creta*, OHG. *krīda*, Ger. *Kreide*, chalk, from

Lat. *creta*, chalk, AS. OHG. *dān*, hill, Engl. *dunc*, from Ir. *dun*, Gael. *dānon*, Welsh *din*, hill, fort; connected with AS. *tūn*, Engl. *town*, OHG. *zūn*, Ger. *Zaun*, hedge). A Parliamentary and municipal borough and market-town of Surrey, England, on the London and Brighton Railway, 10½ miles south of London Bridge (Map: England, F 5). It lies on the edge of the chalk and plastic clay, near the Banstead Downs, at the source of the Wandle. It is an important railway centre. Among its public buildings are the former palace of the archbishops of Canterbury, now used as a girls' school, the restored parish church of Saint John, Whitgift's Hospital, a handsome Elizabethan structure with which is connected a grammar school, and the municipal buildings containing the law courts and central public library.

Owing to its proximity to London, a healthful climate, and the absence of factories, Croydon is a favorite residence place of London business men. This accounts for its great progress in municipal improvements and ownership of public utilities, libraries, water-supply, artisans' dwellings and lodging-houses, parks and recreation grounds, hospitals, baths, electric lighting, and street railways. Its death-rate is a little over 14 per 1000, the smallest in England for a city of its size. It sends one member to Parliament. Population, in 1851, 10,000; in 1871, 55,000; in 1891, 102,000; in 1901, 133,900. Consult Steinman, *History of Croydon* (London, 1836).

CROZAT, KRŌ'zā', JOSEPH ANTOINE, Marquis de Tugny (1696-1740). A French collector of books and objects of art. His various acquisitions included 19,000 original drawings, 2000 engravings, 400 paintings, 1382 intaglios and cameos, and a library of 20,000 volumes. He published two series of engravings of the drawings and paintings in his own collection and in those of the King, the Duke of Orleans, and other collectors. The greater part of these ultimately came into the possession of the Russian Crown. Mariette published a *Description sommaire des dessins des grands maîtres du cabinet de feu Monsieur Crozat* (Paris, 1741).

CROZET (KRŌ'zā') ISLANDS (in honor of a member of the French expedition which discovered the islands). A volcanic group in the Indian Ocean, between Kerguelen and Prince Edward islands (Map: World, O 26). The larger islands are Possession, East, Apostle, and Hog. The total area, including islets and reefs, is about 200 square miles. They have no permanent population, but are occasionally visited by whalers and war-vessels. They were discovered in 1772, and are claimed by Great Britain. Consult Roth, *Crozet's Voyage to Tasmania* (London, 1891).

CROZIER, KRŌ'zhēr, JOHN BEATTIE (1849—). An English writer on philosophy and history. He was born of Scotch parents, at Galt, Ontario, and was educated at the Galt Grammar School and at the University of Toronto. Graduating M.D. in 1872, he at once settled as physician in London. His *Religion of the Future* (1880) was followed by *Civilization and Progress* (1885). To aid him in carrying out his studies, he received in 1894 a civil-list pension of £50, which was doubled four years later. In 1897 appeared the first volume of *The History of Intellectual Development on the Lines of Modern Evolution*. Dr. Crozier has also published *My Inner Life, Being a Chapter in Per-*

sonal Evolution and Autobiography (1898); and *Lord Randolph Churchill: A Study of English Democracy* (1887). In 1899 he received from the University of Toronto the degree of LL.D.

CROZIER, WILLIAM (1855—). A United States artillery officer and inventor of ordnance. He was born in Carrollton, Ohio, and on his graduation from West Point in 1876 was assigned to the Fourth Artillery, in which he served three years, taking part in campaigns against the Sioux and Bannock Indians while at Western posts. From 1879 to 1884 he was instructor of mathematics at West Point, and in 1881 won by competitive examination an assignment to the ordnance department. In 1898 he was major and inspector-general of volunteers. With General Bullington he invented the Bullington-Crozier disappearing gun-carriage (see illustration and description under *ORDNANCE*), which ranks high among modern military inventions, and which has been installed in all the important coast-defense works of the United States. He is also the inventor of a wire-wrapped rifle and a ten-inch gun. In 1899 he was appointed by President McKinley one of the American delegates to The Hague Peace Conference. In the Peking relief expedition in 1900 he served under General Chaffee as chief ordnance officer, and in June, 1902, was appointed chief of ordnance, with rank of brigadier-general. Many of the notes and pamphlets on the construction of ordnance published by the War Department are from his pen. He is of international reputation regarding all matters connected with his department of military science.

CRUCIAN, *krōō'shan* (Dutch *karuts*, Ger. *Karusche*, older *Karas*, *Karutze*, *Karutsch*, from Fr. *carassin*, It. *coracino*, crucian, from Lat. *coracinus*, Gk. *κορακίνος*, *Korakinos*, fish like a perch, from *κόραξ*, *Korax*, raven; so called on account of its color). A species of carp (*Carassius vulgaris*) differing from the common German carp (*Cyprinus*) in the larger scales, in the absence of barbules at the mouth, and in the pharyngeal teeth. It may attain a large size, and inhabits lakes, ponds, and slowly flowing rivers in northern Europe and Asia.

CRUCIBLE (ML. *crucibulum*, *crusibulum*, melting-pot, from OF. *cruche*, Port. *crugo*, crock, from OHG. *chruug*, Ger. *Krug*, AS. *crōg*, jar, or Ir. *crogan*, Gael. *crog*, Welsh *crochan*, pitcher; confused by popular etymology with Lat. *crux*, cross). A vessel for heating and fusing metals, glass, and other materials requiring a great degree of heat for their melting. Crucibles are made in all sizes, from that of a lady's thimble to one which will hold 400 pounds of molten zinc. The essentials in their construction are that they be made to endure extreme heat without fusing, and sudden changes of temperature without breaking. A great variety of materials are used for making crucibles, as clay, plumbago, graphite, lime, aluminum, and platinum. Most crucibles are more or less acted on by litharge, but a chalk lining makes them less so. The most common form is the *Hessian crucible*, made of equal parts of fire-clay and coarse sand. It will stand extreme heat, but not very sudden changes in temperature. This is the cheapest variety, and is adequate for all ordinary processes of experimenting and refining. They come in nests, in sizes varying from two to eight inches in di-

ameter. *Cornish crucibles* are clay crucibles of a coarse grain and mottled grayish-white color. They endure sudden changes of temperature, but cannot be heated to whiteness. They are much used for copper-assaying. *Plumbago* or *coke crucibles* are of great value in the fusion of certain metals. *Graphite crucibles* meet all temperature conditions, but are slowly acted on by metallic oxides or gases. *Lime crucibles* are absolutely infusible. *Aluminum crucibles* possess the advantage of not being readily acted on by the materials fused, even sodium having no effect on them. They are also little affected by changes of temperature. The celebrated *Berlin crucibles* are made of a composition of several non-fusing materials, which contains 8 parts of fire-clay, 4 parts of black lead, 5 parts of powdered coke, and 3 parts of old crucibles.

CRUCIFERÆ (Neo-Lat. nom. pl., from Lat. *cruc*, cross + *ferre*, to carry, bear). An important order of dicotyledonous plants, the mustard family, including about 200 genera and 1600 known species. The flowers have a calyx of four sepals, which fall off after flowering; and a corolla of four petals, which are placed in the form of a cross—whence the name *Crucifera*—and alternate with the sepals. There are six stamens—four long ones in opposite pairs, and two short ones between the pairs of long ones. The ovary is superior, and there are two stigmas. The fruit is either long and podlike, 'siliqua,' or a short and roundish pouch, 'silicle,' one-celled, or usually spuriously two-celled, by the parietal placentæ (see *PLACENTA*) meeting in the middle, and forming a kind of dissepiment (q.v.); and contains either one seed or many in a single row. The grouping of the divisions and genera is extremely difficult, and many systems of classification have been proposed. One classification is founded on the character of the cotyledons and the manner in which the radicle is folded upon them (cotyledons accumbent, incumbent, or conduplicate). A still more recent classification is that of Prantl, whose main divisions are based upon the character of the hairs commonly borne upon the leaves, whether simple, branched, or glandular. The division into tribes is based upon the character of the stigmas. The general character of the order is antiscorbutic and stimulant, with more or less acidity. It contains many plants extensively cultivated for the food of man and of domestic animals, or valuable in medicine, as kale, cabbage, cauliflower, broccoli, colewort, turnip, rape, radish, cress, horseradish, scurvy-grass, mustard, sea-kale, gold-of-pleasure, etc. The dyestuff called woad is produced by a plant of this order. The order includes also a number of garden flowers highly esteemed for their beauty and fragrance, as wallflower, stock, rocket, etc. Sulphur compounds are common in many, as may be recognized from the odor given off when cooking. The pungence and acidity of the *Crucifera* seem to depend on a volatile oil, or on different volatile oils of a very similar character, present in various degrees in different species, or in the same species under different circumstances, and in different parts of the same plant. This diversity is very well illustrated in the common turnip, in the different qualities of the root as to sweetness and acidity in different soils or seasons, and in the difference between the flesh and the rind. The seeds of the

Cruciferae contain a fixed oil, which is extracted from some (rape, colza, in Europe; *Camelina sativa* and *Erysimum perfoliatum* in Japan), to be used as a lamp-oil and in the arts, and the oil cake of which is valuable for feeding cattle. The plants of this order belong mostly to the temperate parts of the Northern Hemisphere, and particularly abound in Europe. Comparatively few are found within the tropics. As now understood, the principal divisions and genera of the Cruciferae are: Thelypodieae, represented by *Thelypodium*; Sinapeae, with *Lepidium*, *Iberis*, *Cochlearia*, *Alliaria*, *Sisymbrium*, *Sinapis*, *Brassica*, *Nasturtium*, and *Cardamine* as the chief genera; Schizopetaleae, represented by *Schizopetalon*; and Hesperideae, which embraces *Capsella*, *Draba*, *Arabis*, *Erysimum*, *Alyssum*, *Hesperis*, *Matthiola*, and *Conringia*.

CRUCIFIX (Lat. *cruci fixus*, fastened to the cross, from *crux*, cross + *figere*, to fasten). A cross with the effigy of Christ affixed to it. It must be distinguished, as an instrument of devotion and liturgical use, from the pictorial or other representations of the scene of the Crucifixion (q.v.). The cross (q.v.), at first used for devotional and symbolic purposes in its simplest form, came first to be decorated with the symbolic sacrificial lamb (see CHRIST IN ART), with the addition sometimes of the medallion bust of Christ, as in the Vatican cross. Perhaps the earliest crucifixes were small devotional objects which contained portions of the supposed true cross, such as that of Mount Athos, or were pictorial crosses, like that of Queen Theodolinda at Monza (sixth century). During the Carolingian Age the crucifix came into somewhat more general use in the West, but, having been opposed in the East shortly after its introduction by the image-hating Iconoclasts (eighth century), it obtained a foothold there not as a plastic image, but in the form of a pictured Crucifixion. The manner in which the figure of Christ was represented on the crucifix is the same as that in pictures of the Crucifixion. During the Romanesque and Gothic periods there was an increasing number of large crucifixes, in some of which the figure was almost or wholly life-size. These were mainly of four classes—the stationary *altar crucifix*, that stood in the centre of the altar or at the entrance to the choir, sometimes with accompanying statues of the Virgin and Saint John (e.g. at Wechselburg, Saxony, thirteenth century); the *road crucifix*, at cross-roads, or to mark certain spots for devotion; the *station crucifix*, which often crowns a hall at the end of a line of devotional stations (q.v.) known as the Way of the Cross; the *processional crucifix*, usually smaller and of metal, carried in religious processions. All such crucifixes became very numerous from the thirteenth to the sixteenth century, and were sometimes carved by the greatest sculptors, as in the case of Brunelleschi's crucifix in Santa Maria Novella, and Donatello's, also in Florence.

A curious compromise between a picture of the Crucifixion and a crucifix is a class of representations in which the figure of Christ is painted on a panel cut in the shape of a cross. A very early instance is in the Cathedral of Spoleto. Others by the Berlinghieri, Margheritone, and other early painters (thirteenth century) exist at Lucca, Pisa, and Florence. The plastic crucifix was more popular in northern Europe than in

Italy before the fifteenth century, and was often executed in wood, while for smaller examples ivory and metals were most used. The realistic schools of North Italy, however, during the fifteenth and sixteenth centuries, gloried in realistic crucifixes of painted wood and terra-cotta, especially the artists of Modena. The most impressive are the large station crucifixes, such as that of the Sacro Monte at Varallo. Consult: Carus, "The Crucifix," in *The Open Court*, vol. xiii. (Chicago, 1899); Stockbauer, *Kunstgeschichte des Kreuzes* (Schaffhausen, 1820).

CRUCIFIXION, THE. The title of many paintings, among the most famous of which are: Lucas Cranach's, in the Stadtkirche at Weimar, Germany; Albert Dürer's, in the Dresden Museum; Mantegna's, in the Louvre; Van Dyck's, in Saint Michael's, Ghent; Rubens's, in the Antwerp Museum; Perugino's, a fresco, at the chapter-house of Santa Maria Maddalena dei Pazzi, in Florence; Tintoretto's, in the Senola di San Rocco, Venice; Fra Angelico's in the monastery (now the museum) of San Marco, Florence. Twenty saints in life-size surround the cross, and below are portraits of seventeen Dominicans.

CRUDEN, KRŪD'ən, ALEXANDER (1701-70). An English scholar, maker of a well-known Bible concordance. He was born at Aberdeen and educated at Marischal College in that city, with a view to the Church, but having exhibited decided symptoms of insanity, he was for some time placed in confinement. On his release he left Aberdeen, and after spending several years as a tutor in and about London, settled in London in 1732 as a bookseller. In 1735 he received the title of 'bookseller to the Queen.' In 1736 he began, and the next year published, his *Complete Concordance of the Holy Scriptures of the Old and New Testaments*. Soon afterwards he relapsed into insanity and his friends were obliged to remove him to a private asylum, where he appears to have been harshly treated. On his recovery he published an account of his sufferings (1738). He then acted as a corrector for the press. Cruden now believed himself divinely commissioned to reform the manners of the world, and styled himself Alexander the Corrector. He went about the country exhorting the people to keep holy the Sabbath day, etc. He also petitioned the King for the honor of knighthood, and Parliament to constitute him by act 'the corrector of the people,' hoping by such honors to influence the people more effectually. The second edition of his concordance appeared in 1761 and the third in 1769; since then it has been repeatedly reprinted in full, with his definitions, which make it a Bible dictionary, or in abridgment, and has been made the basis of other concordances. Perhaps the best edition of the complete work is by Alexander Chalmers (London, 1812; 10th ed. 1824), with his life. Cruden died at Islington, London, November 1, 1770. See CONCORDANCE.

CRUDOR, Sir. A knight in Spenser's *Faerie Queene*, who before he will marry Briana demands of her enough hair from ladies' curls and knights' beards to 'purfle' him a cloak. This she obtains from passers-by until Sir Calidore vanquishes him, and people are again free to pass the castle unshorn.

CRUELTY (OF. *cruaulte*, *cruelte*, Fr. *cruauté*, from Lat. *crudelitas*, cruelty, from *crudelis*, cruel, *crudus*, raw). The intentional infliction of unnecessary pain. As a legal term it is used chiefly in connection with divorce, with the treatment of children, and the treatment of animals.

As a ground for *divorce*, cruelty is not limited to physical violence, although formerly it was thought to be thus limited. It is now held to include any unjustifiable conduct on the part of either husband or wife which so grievously wounds the feelings or destroys the peace of mind of the other as seriously to impair bodily health or endanger life, or which utterly destroys the legitimate ends and objects of matrimony. See *DIVORCE*.

While the common law does not permit a child to sue a parent in *tort* for injuries inflicted by cruel chastisement, it does provide for the criminal punishment of parents guilty of such cruelty, and courts of equity have not hesitated to take children away from a parent who abuses their persons or corrupts their morals. Cruel treatment of animals by their owners is not a criminal offense at common law unless it is of such an aggravated kind as to amount to a nuisance. See *CRUELTY TO ANIMALS*; *CRUELTY TO CHILDREN*; *HUSBAND AND WIFE*; *PARENT AND CHILD*.

CRUELTY TO ANIMALS, PREVENTION OF. The earlier laws on this subject were not so much the outcome of humane principles as for the protection of animals considered as property. At the common law cruel treatment of animals by their owner was a criminal offense only when it was so aggravated as to be a nuisance. But the general tendency of the nineteenth century toward the organization of philanthropy was not slow to operate in this direction. England was the first country to organize (in 1824) a society for the purpose. Legislative enactments followed, and the statute of 1849 provides a penalty not exceeding £5 (in addition to a further sum recoverable as damages by the owner) for any person who 'shall cruelly beat, ill-treat, overdrive, abuse, or torture' a variety of domestic animals. The movement spread to Germany, France, and the United States. The first American society was chartered by the Legislature of New York in 1866, chiefly through the efforts of Henry Bergh (q.v.), who was its president for twenty-two years. Cruelty to domestic animals is now punishable in most of the United States by fines ranging from \$5 to \$100, or imprisonment from thirty to sixty days, or both. The Ohio law, as amended in 1898, specifies cruelty by beating, mutilating, lack of good food and water, carrying in an inhuman manner, overwork, and crowded transportation. The New Hampshire law of 1897 gives the officer making an arrest the right to seize the animal, notifying the owner, and to kill it if disabled, or to hold it as security for proper damages.

The Pennsylvania Society for the Prevention of Cruelty to Animals (founded 1867, incorporated 1868) is generally accepted as a model. It endeavors to prevent cruelty by moral suasion and well-considered advice, rather than by coercion. It tries to educate where cruelty is due to ignorance, and thus attempts to secure the use of proper harness and bits for horses, and the abolition of the check-rein. A similar movement in England against the check-rein, excessive

curbing, and the docking of horses' tails received great impetus from the hearty support of King Edward VII., then Prince of Wales. The Pennsylvania society was the first to provide (1874) an ambulance for the removal of disabled animals and a derrick with chain pulley and sling for hoisting animals out of holes. In several States the weight of a load which may be drawn up-hill is carefully regulated by the work of such societies; and homes are very generally established for stray dogs and cats, where the animals are painlessly put to death in case of need. Similar societies now exist in nearly every European country, in Algeria and South Africa, in Australia, and in Mexico, Brazil, and the Argentine Republic. See *VIVISECTION*; *CRUELTY TO CHILDREN, PREVENTION OF*.

CRUELTY TO CHILDREN, PREVENTION OF. Owing to the long survival of the Roman idea of parental power (see *CRUELTY*), and the comparatively late growth of a tendency toward socialistic legislation, it was not until very recent times that organized effort in this direction became common. Curiously enough, the movement in the direction of organization, in the United States at least, did not take definite shape until eight years after that for the prevention of cruelty to animals. The New York Society for the Prevention of Cruelty to Children was organized in January, 1875, and within five years ten other societies followed, from Boston to San Francisco. As the movement grew, some societies originally intended for the protection of animals added the care of children to their purpose. In other cases 'humane societies' were organized to cover both purposes. The total number of societies in the United States in 1900 for the protection of children, or children and animals, was 161. They were brought into close relations by the Humane Association (q.v.), which has included societies for the protection of children since 1887. As in the case of animals, their work is two-fold—the promotion of better legislation in their field and the diligent enforcement of existing laws. They also investigate cases of alleged cruelty or neglect, and present to the courts such facts as they learn. The New York society exceptionally includes the investigation of cases of destitution. By the work of the agents whom it stations in all the magistrates' courts it has come to have a powerful advisory influence on the commitment of destitute, neglected, and wayward children in New York City, thus affecting the lives, on an average, of about 15,000 children. These societies in general are private corporations, supported by subscriptions, although in New York, Philadelphia, and a few other places, some aid has been given from public funds. In the State of Indiana since 1889 boards of children's guardians have been organized by law, which not only investigate cases of cruelty and neglect and secure the punishment of the offenders, but also undertake subsequent oversight of the children. The Colorado Humane Society was made by the Legislature of 1901 a 'State bureau of child and animal protection,' with an appropriation of \$3000 per annum for two years; this, however, remains under private control, though three State officers are made *ex officio* members of its board of directors. Consult Folks, *The Care of Destitute, Neglected, and Delinquent Children* (New York, 1902). See *DEPENDENT CHILDREN*.

CRÜGER, krü'gēr, JOHANNES (1598-1662). A German choral composer and musical author. He was born at Grossbresen, Province of Brandenburg, and was educated at the Jesuit College in Olmütz, under Hamburger at Ratisbon, and at the University of Wittenberg. He was cantor of the Nikolaikirche, Berlin, from 1622 until his death. As a composer of Lutheran chorals, he has never been excelled, and many of his melodies, such as *Nun danket alle Gott*; *Jesus, meine Zuversicht*; *Schmücke dich, o liebe Seele*, have survived to the present day. His sacred compositions were published under the title *Præcis Pietatis Melica, oder Kirchen-Melodien über Luthers und Anderer Gesänge*, for four voices and two instruments (30th ed. 1703).

CRUGER, krü'gēr, JULIA GRINNELL STORROW (c.1850—). An American author, known by the pen-name 'Julien Gordon,' whose published works include the novels *A Diplomat's Diary* (1890); *A Puritan Pagan* (1891); *A Successful Man* (1892); *Poppa* (1894); and *Eat Not Thy Heart* (1897).

CRUIKSHANK, krük'shänk, GEORGE (1792-1878). An English caricaturist. He was born in London, September 27, 1792, the younger son of Isaac Cruikshank, himself a caricaturist. His early wish to follow the sea was opposed by his mother, who desired that his father should instruct him in art; but his father refused, and George failed to secure entrance into the Royal Academy schools. The idea of adopting art as a profession was for the time abandoned. Subsequently, at the death of his father, having his mother to maintain as well as himself, he turned to drawing. His apprentice work as caricaturist appeared in the monthly periodicals called, respectively, *The Scourge* and *The Meteor*; and about the same period he made the sketches referring to the trial of Queen Caroline. Indeed, a great deal of his work, which at that time reflected the political situations of the day, may be looked upon now as being fairly historical in its bearing. As early as 1823 he began the illustrations for Grimm's *Fairy Tales*. In 1835 he published the first number of the famous *Comic Almanac*, which flourished under various managements until 1853. In 1847 he made a series of wood-cuts on "The Bottle," and his "Sunday in London," "The Gin Trap," and "The Gin Juggernaut," published at this time, had a wide circulation. It is said that the unfortunate life of a personal friend influenced him to exercise his gifts in a crusade against intemperance. A strong moral was enforced in these drawings. His best-known illustrations were those made for Dickens's *Oliver Twist* and the *Sketches by Boz*, those for the Waverley novels, and for the *Memoirs of Grimaldi*. In 1833 he designed and etched fifteen plates for illustration of *Don Quixote*. In later years he essayed to paint, and, though he had little skill in manipulating pigments, his efforts in that direction show his keen insight into human nature and his unique genius in portraying the grotesquely humorous. His "Cinderella," painted in 1854, is in the South Kensington Museum. In 1862 he painted for the National Temperance League "The Worship of Bacchus," which is now in the National Gallery. Rossetti wrote, in reference to this picture, that "the man who in his old age occupies himself for nearly three years in painting this

homily upon canvas, to the most negative results in point of art, deserves respect." George Cruikshank died in London, February 1, 1878, and was buried in St. Paul's Cathedral. Consult: Stephens, *A Memoir of George Cruikshank* (London, 1891); Bates, *George Cruikshank* (London, 1878); Jerrold, *Life of George Cruikshank* (London, 1883).

CRUIKSHANK, ISAAC (c.1756-c.1811). An English caricaturist and water-color painter. His father was an artist, and young Cruikshank, early left an orphan, followed his profession as an illustrator, water-color painter, and political caricaturist. He settled in London, and married Miss Mary Macnaughten; excepting this, very little is known of his career. Two of his water-colors, "A Child Lost" and "A Child Found," are in the South Kensington Museum. His political drawings were as well known as those of Gillray. His other designs include, "The Rage; or, 'Shepherds, I Have Lost my Waist,'" a skit on the exaggerated fashions of the times. His oldest son, ISAAC ROBERT (1789-1856), born in London, was a miniature painter and caricaturist. He satirized the political and social customs of the time, but after 1825 seems to have taken more to illustrating. His most popular work was done for *Life in London* (1821), in collaboration with his brother George, the text being supplied by Pierce Egan. It was dramatized and achieved a notable success. Another work of Cruikshank's was seventy-one illustrations for Charles Molloy Westmacott's *English Spy* (1825); and illustrations for Crithannah's *Original Fables* (1834); Colburn's *Kalendar of Amusements* (1840); and *The Orphan*, a translation of Eugène Sue's *Mathilde*. While neither a gifted nor as imaginative as his celebrated brother George, Robert Cruikshank was a good draughtsman and a clever artist.

CRUIKSHANK, WILLIAM CUMBERLAND (1745-1800). A Scottish anatomist, author of a number of medical works, the most valuable of which is one on *Insensible Perspiration*, showing that carbonic acid is constantly given off by the skin. His work further includes *The Anatomy of the Absorbing Vessels of the Human Body* (1786).

CRUISER (from *cruise*, from Dutch *kruisen*, to cruise, to cross, from *kruis*, O.H.G. *cruci*, Ger. *Kreuz*, AS. *crūc*, Engl. *cross*, from Lat. *crux*, cross). A war-vessel built for cruising. The principal features of a cruiser are: (1) seaworthiness; (2) ability to keep at sea for long periods (this requires large capacity for coal and stores, and habitability); (3) speed; (4) offensive and defensive powers. Cruisers are of many kinds, but they may be divided into three general classes—*armored cruisers*, *protected cruisers*, and *unprotected cruisers*. The dividing line between the classes is not very distinct, as some cruisers partake of the character of two classes. *Armored cruisers* carry armor for the protection of the ship, or battery, which is applied vertically, or nearly so. *Protected cruisers* have no vertical armor, but the vitals are protected by a thick steel deck, which is nearly horizontal, placed about the level of the surface of the water, but having the edges of the deck near the ship's sides inclined downward, so as to meet the side several feet below water. This part of the deck (the slope) is thicker than the middle part,

called the *flat*. *Unprotected cruisers* have no protective deck. Some of them have a watertight deck in the same region, but of insufficient thickness to admit of styling it a *protective* deck. Cruisers are frequently divided into first-class cruisers, second-class cruisers, etc. These distinctions are purely arbitrary, and differ in the various navies. In the United States Navy small cruisers are called gunboats. This is a term properly applicable to craft so small as to approximate to large boats. In the British Navy the terms 'gunboat' and 'gun-vessel' are used almost as loosely. In addition to the regular cruisers, a most important addition to the naval force in time of war is found in fast merchant steamers, which are frequently armed as *auxiliary cruisers*, and used as ocean scouts, or fleet scouts; in the former case, they are bound on distant missions; in the latter, they accompany the fleet.

CRUITHNIGH, kruth'nī, or **CRUITHNIANS**, kruth'nī-anz. The name given by the Irish to invading tribes of Picts, from whom the kings of Ulster were supposed to have descended. The appellation was subsequently applied to some of the inhabitants of the counties of Antrim and Down. They were also called Dalaradians, and their country Dalaradia (q.v.). The name Cruithnigh is sometimes derived from the custom of painting and tattooing practiced by the people. The Irish called the Picts of Britain Cruithnigh, and it is probable that the Irish Cruithnigh were related to those of Britain, as a Pietish colony came from Scotland and settled in Dalaradia a century before the Christian Era.

CRUIVE, kriv, or **ZAIRE**, zâr (probably from Gael. *crò*, sheep-cote, hovel). A contrivance erected upon rivers in Scotland for the purpose of catching salmon. These weirs are of great antiquity, and consist of a kind of hedge formed by stakes driven into the ground, the interstices being filled with brush, and the mode of capturing salmon being similar to those employed with bag and stake nets. See **NET**.

CRUMMELL, ALEXANDER (1818-98). A negro clergyman of the Protestant Episcopal Church. He was born in New York, was educated at the Oneida Institute, N. Y., and graduated from Cambridge University, England. He held a professorship in the Liberian College, at Liberia, West Africa, and then returned to the United States, and was rector for twenty-two years of St. Luke's Church, Washington, D. C. He was one of the first of the negro clergymen to enter the Episcopal Church. His works comprise: *The Future of Africa* (1862); *The Greatness of Christ, and Other Sermons* (1882); and *Africa and America* (1891).

CRUMMLES, krum'lz, VINCENT. The head of a theatrical family, in Dickens's *Nicholas Nickleby*, consisting of himself, his wife, two sons, the 'Infant Phenomenon,' and a performing pony. A big-bodied, big-hearted man, who is very kind to Nicholas and Smike.

CRUNCH'ER, JERRY. In Dickens's *Tale of Two Cities*, a general utility man in Tellson's banking house by day, and a 'resurrection man' at night. His wife's constant prayers he calls 'flopping.'

CRUQUIUS, krook'kī-ūs. The Latinized name of a renowned Flemish scholar of the sixteenth

century, Jacques de Crusque. He was professor at Bruges, and his studies in Horace have had a most important influence on our knowledge of that poet. In his commentary on Horace, Cruquius gives readings from the four valuable 'Blandinian' manuscripts, since destroyed, one of which is very ancient; and also quotes the marginal notes of an early commentator, whose name is lost, but who is now cited as 'Commentator Cruquianus.'

CRUSADE (Fr. *croisade*, It. *crociata*, from ML. *cruciata*, crusade, from *cruciare*, to mark with the cross, from Lat. *crux*, cross). A war undertaken for a religious purpose; specifically one of the wars waged by the Christians for the recovery of the Holy Land. Toward the close of the eleventh century, when the Byzantine Empire was in great danger of being conquered by the Seljukian Turks, the Emperor Alexis Comnenus appealed to Pope Urban II. for help. At the Council of Clermont, in November, 1095, the latter made his memorable speech, in which he exhorted his hearers to bear aid to the Eastern Empire, and to reconquer Jerusalem. His fiery eloquence evoked an enthusiastic response; for he appealed to all the motives which were then influential—to the spirit of religious enthusiasm; to the love of fighting and adventure; and to the desire, in many, of bettering their fortunes. After the conclusion of Urban's speech, many pressed forward to take the Crusader's vow and the cross, which was the symbol of this vow and gave its name to the movement. The agitation spread rapidly to all the countries of western Europe and embraced all ranks of society. The nobles made deliberate preparations for an expedition which was expected to last three years; but the common people, among whom Peter the Hermit (q.v.) and others had been busily preaching the Crusade, were too impatient, and many of them too poor, to wait. In the spring of 1096 thousands of men, women, and children started in different bands under the leadership of Walter the Penniless, Peter, and others. They marched from Cologne and the Rhineland, across Germany, through Hungary, along the Danube, and southward to Constantinople. These bands were very disorderly; their course was marked by persecution of the Jews, robbery, and plunder, and many of them were slaughtered by the infuriated inhabitants of the countries through which they passed. Those who reached Constantinople were received graciously by the Emperor. Their disorderly conduct, however, soon caused him to transport them to Asia Minor, where almost all were slain by the Turks. The march of these disorderly bands is generally styled the *Peasants' Crusade*.

THE FIRST CRUSADE, 1096-99. In the summer and fall of 1096 the real armies, led by the nobles, began their march. Among the leaders were Godfrey of Bouillon, Bohemond, Prince of Tarentum, Robert of Normandy, Robert of Flanders, and Raymond, Count of Toulouse, who was the latest of all to start. They proceeded by different routes to Constantinople, where they were delayed by the Emperor, who was alarmed by their numbers and lack of discipline, but wished to make use of their strength. An agreement was finally made, by which almost all of the leaders were induced to become his vassals, but in the campaign which followed neither party

kept its promises, and the long negotiations resulted only in a mutual feeling of antagonism, which proved disastrous to the Christian cause. All of the Crusaders met at the siege of Nicæa, in May, 1097, when the army may have numbered 100,000, besides the women and non-combatants. Six millions were said to have taken the cross, but undoubtedly the number was greatly exaggerated; many, besides, who had taken the vow had turned back or were dead. Nicæa was taken, the Sultan of Iconium was defeated at Dorykleum, and in a few months the Crusaders accomplished the arduous march to Antioch, which was captured after a siege lasting from October 21, 1097, to June 2, 1098. In the meantime, Baldwin, brother of Godfrey, had taken possession of Edessa for himself, and Bohemond established himself as Prince of Antioch. The leaders became so intent on making conquests for their own profit that the advance to Jerusalem was delayed for months. Finally, on June 7, 1099, the remnants of the army, about 20,000 in number, reached Jerusalem. After a siege of five weeks, the city was captured by reckless daring, on July 15. The Crusaders vented their wrath in an indiscriminate massacre, in which neither youth nor age was spared, and men and women were slaughtered in the holy places. The leaders wrote home exultingly, "In Solomon's Porch and in his temple our men rode in the blood of the Saracens up to the knees of their horses." Godfrey was elected 'Baron and Defender of the Holy Sepulchre,' and after the battle of Ascalon, in which the Egyptian army was defeated with great slaughter, almost all of the Crusaders returned home, leaving Godfrey with a small band of followers to defend Jerusalem. Bohemond held Antioch with his Norman followers. Baldwin was in the distant Edessa. A large part of Asia Minor was restored to the Greek Emperor. The news of the victories gained by the Crusaders set into motion three great armies from France, Germany, and Italy (1101-02), but, owing to their own excesses and folly, they fell an easy prey to the Mussulmans in Asia Minor.

THE SECOND CRUSADE, 1147-49. In 1144 Edessa was captured by the Mohammedans. The news of its loss aroused great alarm in the West, and a new Crusade was initiated, in which special privileges were offered to all participants. Bernard of Clairvaux was the great preacher of this movement. Conrad III. of Germany and Louis VII. of France took the cross and led great armies to the relief of the Holy Land. Conrad and Frederick Barbarossa starting from Ratisbon, in April, 1147. The march was very disorderly, and when the Crusaders entered the Byzantine Empire they came to blows with the Greeks. After much trouble, the Bosphorus was crossed and the army advanced into Asia Minor, led by Greek guides. The guides proved treacherous, the troops were harassed by the Turks, and finally, threatened with famine and death, they retreated, closely pursued by the enemy, scarcely one in ten getting back to Nicæa. Louis had better fortune: his army was more orderly, and he was well received by the Greek Emperor, although, when the French King crossed to Asia Minor, the Emperor refused to furnish guides until Louis and his barons had taken the oath of homage. Near Nicæa they met the German fugitives, with whom they joined forces and

marched along the coast. Conrad soon turned back and spent the winter in Constantinople, but Louis went on, and, after meeting with a terrible defeat, in which the Greeks aided the Turks, he and his knights went by ships to Antioch, while the common people were left behind to be slaughtered. From Antioch, Louis proceeded to Jerusalem, where he was joined by Conrad. Together they planned the renewal of hostilities on a grand scale, but their schemes miscarried, and the kings went home in disgust.

THE THIRD CRUSADE, 1189-91. The capture of Jerusalem by Saladin, in 1187, caused Frederick Barbarossa, Philip Augustus of France, and Richard the Lion-Hearted of England to take the cross. Frederick was drowned soon after he reached Syria. Richard and Philip captured Acre after a long siege; but the two kings quarreled so bitterly that Philip went home soon after the capture. Richard, thwarted at every turn by Saladin (q.v.), was compelled to make a truce without accomplishing anything more.

THE FOURTH CRUSADE, 1201-04. Innocent III. (q.v.) made every effort to bring about a new Crusade. A great number of Latin nobles and knights were induced to take the cross, and the enthusiasm of the people was unbounded. Among the leaders in this Crusade were Baldwin of Flanders, Boniface of Montferat, and Geoffroy de Villehardouin, Louis of Blois, and Simon de Montfort. Arrangements were made with Venice that the republic should supply the vessels and provisions for the journey; but, when the Crusaders reached Venice, they could not raise the amount agreed upon for payment. After a long delay, they made a new bargain with Venice by undertaking to capture for her the city of Zara, in Dalmatia. The common soldiers were kept in ignorance of the infamous plan until it was too late for effectual protest. Zara was sacked, and the army spent the winter there. In the meantime, a new plot was hatched by which, under pretense of reinstating the rightful Byzantine Emperor, Isaac Angelus, the Crusade was diverted to Constantinople. Isaac Angelus was restored to his throne, but, as he was not able to fulfill the conditions to which he had been compelled to agree, the Crusaders turned against him. Constantinople was captured a second time and sacked (1204). Much of the city was burned, precious works of art were destroyed, and enormous quantities of booty were secured. The Crusaders and the Venetians divided their conquests, and the Latin Empire (q.v.) was established. The last three Crusades effected little permanent good for the Christian cause. *The Fifth Crusade* took place in 1228-29. The German Emperor, Frederick II. (q.v.), who had taken the vow, went to the Holy Land and, by a treaty with the Mohammedan powers, secured Jerusalem. In 1244 the Holy City fell into the hands of the Kharezmians. *The Sixth Crusade* (1248-54) was led by Louis IX. of France (Saint Louis). He invaded Egypt, and, although at first successful, was soon defeated, captured, and compelled to pay an enormous ransom. He then went to the Holy Land, rebuilt some fortresses, but accomplished little of importance. In 1270 he started on the *Seventh Crusade*, but was induced to turn aside to Tunis, where he died. Edward Plantagenet associated himself with Louis IX. in that Crusade. He abandoned the Holy Land in 1272, and this

year is generally considered to mark the end of the Crusades.

In addition to the seven principal Crusades, there were countless other expeditions. In some of these large armies took part, as in the Crusade of 1101, of which mention has been made; the German Crusade of 1197; the Children's Crusade (q.v.) in 1212; and the Crusade of John of Brienne and Andrew II. of Hungary in 1217-21, which achieved the conquest of Damietta, in Egypt, in 1219. The last is often called the Fifth Crusade, and in fact the first four Crusades are the only ones to which the same numbers are assigned by unanimous consent. In addition, almost every year, from 1100 to 1270, small bands of Crusaders went to the Holy Land, and after 1270 many attempts were made to reconquer Jerusalem. There were also Crusades in the West against the Moors in Spain, and against the heathen Prussians. (See article TEUTONIC KNIGHTS.) Besides these Crusades against pagans, many Crusades were preached against the Albigenses (q.v.), the Hohenstaufen (q.v.), and other opponents of the popes, the name being used for all kinds of expeditions in which the Church was interested.

THE RESULTS OF THE CRUSADES. The Crusades were of very great importance in the history of Europe in that they accelerated many movements which without them would probably have advanced much more gradually. They contributed to the growth of the great Italian seaports, by establishing closer commercial communications between Europe and the East; they enriched the Church and increased its powers, and they helped to develop the strength of the French monarchy in killing off large numbers of the turbulent nobility, and removing others to a more grateful field of activity in Asia and Africa. For Europe at large the most important results were these: (1) They checked the advance of the Mohammedans for a considerable period of time; for, by carrying the war into the enemy's country, they prevented his advance into Europe. It is true that too much stress may be laid on this fact, for the Crusades undoubtedly weakened the Byzantine Empire and made it an easier prey for the Turks in the fifteenth century; but in the twelfth and thirteenth centuries the Crusading States in the East served as outposts to guard against the invasion of Europe. (2) The Crusades enriched Europe greatly by promoting the growth of commerce. In order to transfer the Crusading armies and to supply their various needs, great fleets had to be built. These brought back to the West the products of the Orient. In Asia and Africa, the Crusaders acquired new tastes and desires, which had to be gratified by a more extensive commerce—witness the remarkable growth in the use of sugars and spices in the twelfth century. Money, which previously had been hoarded, was put into circulation, to equip the crusading hosts. All of these causes led to a remarkable growth in wealth and prosperity, which benefited especially the inhabitants of the cities in western Europe. This is regarded by many as the most important result of the Crusades. (3) The Crusades caused a broadening of the intellectual horizon and originated a tendency toward skepticism. "On its Oriental *Studienreisen*, young Europe studied industriously and with great results." The constant contact for two centuries with the more

advanced Byzantine and Arabic culture taught the Crusaders many lessons in civilization. The admiration which they learned to feel for heretics and Mohammedans dispelled many of their prejudices. Some Crusaders became Mohammedans, others became free-thinkers. There was a rapid spread of heresies. "The roots of the Renaissance are to be found in the civilization of the Crusades." There have been three periods of great advance in the history of Europe: the Crusades, the Reformation, and the French Revolution; and of these three the Crusades were not the least important and influential.

BIBLIOGRAPHY. The literature of the Crusades is very extensive, and only a few of the principal titles can be given. The most important collection of sources is the *Recueil des historiens des croisades*, of which fourteen folio volumes have been published (Paris, 1841, et seq.). Consult also: Bongars, *Gesta Dei per Francos* (Hanover, 1611), and the publications of the *Société de l'Orient* (Paris, 1878-84). Of general histories the best are: Wilken, *Geschichte der Kreuzzüge* (7 vols., Leipzig, 1807-32); Michaud, *L'histoire des croisades* (Paris, 1825-29, many editions), and also an English translation by Robson, *History of the Crusades* (London, 1881); Kugler, *Geschichte der Kreuzzüge* (Berlin, 1891); Arber and Kingsford, *The Crusades* (New York, 1895); Prutz, *Kulturgeschichte der Kreuzzüge* (Berlin, 1883); von Sybel, *Geschichte des ersten Kreuzzuges* (Leipzig, 1900); Röhrich, *Geschichte des Königreichs Jerusalem* (Berlin, 1898). See ANTIQOII, PRINCIPALITY OF; DAN-DOLO; LATIN KINGDOM OF JERUSALEM.

CRUSADE, CHILDREN'S. See CHILDREN'S CRUSADE.

CRUSCA, krōō'skā, ACCADEMIA DELLA. See ACADEMY.

CRUSENSTOLPE, krōō'zen-stōl'pe, MAGNUS JAKOB (1795-1865). A Swedish publicist and author, born in Jönköping. He became editor of *Ställningar och förhållanden* in 1838, and for publishing therein certain expressions against the Government was imprisoned from 1838 to 1841. He is best known for his historical fiction, such as *Morianen* (The Moor, 1840-44) and *Carl Johan och Svenskarne* (Carl Johan and the Swedes, 1845-46).

CRUSHING MACHINERY. See GRINDING AND CRUSHING MACHINERY.

CRUSIUS, krōō'zē-ōōs, OTTO (1857—). A German classical philologist, professor in the University of Heidelberg. He was born at Hanover, December 20, 1857. He is the author of *Zur griechischen Religionsgeschichte* (1886) and *Untersuchungen zu den Mimiamben des Herondas* (1892), etc.; and the editor of *Philologus*; *Herondas* (1901); *Fabeln des Babrius* (1897); *Griechische Lyriker* (1897 et seq.), etc.

CRUSOE, krōō'sō, ROBINSON. See ROBINSON CRUSOE.

CRUSTACEA (Neo-Lat. nom. pl., from Lat. *crusta*, crust). A class of gill-bearing aquatic arthropods, differing from other Branchiata in having five pairs of appendages on the head, the first two of which are antennæ, and in having all of the limbs except the first pair of antennæ biramous.

STRUCTURE. The Crustacea derive their name from the hard armor which in most of them

covers the whole body, forming a complex exoskeleton, calcareous and intermediate between shell and bone in the higher forms, while in the lower and smaller kinds it consists principally of chitin, and corresponds more nearly in its nature with the integuments of insects. It is secreted by the epidermis on its outer side, and serves not merely for protection, but also for the attachment of the muscles. Its color is dependent upon the absence, or presence and amount, of pigment, which is also a product of the epidermis, and is formed during the growth of the skeleton. These pigment-cells are often very ornamental, especially under the microscope, as their shape is beautifully and very irregularly stellate. Usually, however, the pigment is so abundant as to make the body-wall opaque and the individual pigment-cells are no longer visible. The mineral matter of the skeleton is chiefly carbonate of lime. The smallest crustaceans have little or none in the skeleton, but in all of the larger forms it is present in greater or less abundance. In the so-called 'stone-crabs' so much is present that the skeleton is really as hard as a rock. In all cases, however, where the skeleton covers a joint it is thin and free from mineral matter, thus permitting perfect freedom of movement. The bristles and hairs often found on the outside of the skeleton are of the same essential structure as it, and have a central core of epidermis. In barnacles (q.v.), ostracods, water-fleas (q.v.), and a few other crustaceans, there is, in addition to the external skeleton, and formed as an outgrowth of it, a true shell, whose only function is protection. This shell may consist of several pieces, as in barnacles, or be strictly bivalve, as in water-fleas, and it may be wholly chitinous or very firmly calcified. Sometimes it is capable of inclosing the entire animal, but often it only seems to protect certain parts. It is usually hinged along the dorsal side of the animal, where it is attached to the skeleton, and is supplied with muscles for closing it.

The crustacean body is composed of segments, some very distinct, while others coalesce or are consolidated, of which the thorax of a crab affords an excellent example. The first five rings are regarded as forming the head, the next eight the thorax, when that part of the body is separable from what follows.

Epidermis and Molting.—The crustaceous covering has beneath it a true skin, and, like the epidermis, is cast off from time to time and supplied anew, as the growth of the animal requires more room for the internal parts. In this molting or casting of the shell, the animal divests itself of its covering not in separate parts, but in one piece, including the coverings of the limbs and even of the antennæ, although the membranes which connect the hard plates are split and torn. A period of apparent sickness precedes and agitation accompanies the process; and the thick muscular parts of the limbs of crabs and lobsters become soft and flaccid, so as to be more easily extricated from their hard covering. The loss of a limb, which sometimes takes place in this process, and is otherwise a frequent occurrence, is easily repaired, for a new one grows in its stead; but it is a curious circumstance that in order to this reproduction the limb must be broken off at a particular joint, the second from the body, thus leaving only a short stump; and when a limb is broken else-

where, the animal itself exercises the remarkable power of throwing it off by this joint.

Locomotive and Other Organs.—The principal organ of locomotion in many Crustacea, as in the lobster, shrimp, etc., is the abdomen, terminating in fan-like appendages; by bending the abdomen suddenly down under the body, the animal darts backward in the water. The limbs, which are connected with the thoracic rings, are, in some, organs of swimming; those of others are used for walking at the bottom of the water or on dry ground. Some have 'swimming-feet' or pleopods attached to the abdomen, often very different from the thoracic legs. The legs of some are fitted for burrowing. The first pair of legs is not infrequently transformed into a pair of powerful pincers or 'claws,' the last joint but one being prolonged so as to oppose the last joint, which becomes attached as to the side of it; and these are used for seizing and tearing food. The first pair of appendages are organs of touch called antennules; following these are the antennæ, also sense-organs; then come a pair of powerful jaws, the mandibles; and back of these are two pairs of accessory jaws, the maxillæ. The thoracic feet, which follow in regular order, are sometimes modified to function as jaws, and are then called maxillipeds. In some forms the mouth-parts are greatly modified to form sucking instead of masticating organs. The digestive organs are very simple; there is a short but capacious gullet, a large stomach, and a straight and simple intestinal tube. A well-developed digestive gland called the liver is often present. The pyloric region of the stomach is sometimes furnished with a remarkable apparatus of hard tubercles or sharp teeth for grinding or tearing food. Many of the Crustacea feed on animal food, and are very voracious; many, however, feed on vegetable food. The nervous system of crustaceans agrees generally with that of other arthropods, and exhibits many gradations of concentration. The eyes are either simple (ocelli), aggregate (consisting of several ocelli under a common cornea), or compound; and the compound eyes are often elevated on stalks. Besides eyes some crustaceans have ciliated pits or cavities that seem to be sense-organs, perhaps for smell or taste. Others have otcysts or positional organs, but it is doubtful whether any have the sense of hearing. In some Schizopoda there are also 'accessory eyes' on the basal points of certain thoracic feet and in the middle line of the abdomen. The gills are variously placed, on the sides of the body, or on the thoracic limbs, on the abdominal legs, etc. The heart is always in the middle line of the body on the dorsal side, is of variable form, and distributes the blood by a number of trunks through the system; but the blood returns to venous sinuses, from which, and not from the heart, it is sent into the gills, and it is not until after its aëration in the gills that it comes to the heart again.

REPRODUCTION AND ECOLOGY. The sexes are distinct in most Crustacea, and all are oviparous. The eggs are almost invariably hatched in water, even those of terrestrial forms, and a sort of incubation often takes place, as the eggs are carried about under the abdomen or thorax of the female, attached to the pleopods or other appendages. Except in a few cases the development takes place by metamorphosis, through a very remarkable series of larval stages. All the

lower Crustacea hatch as minute, oval, unsegmented creatures with three pairs of appendages, and this larva is called a nauplius. Although the higher Crustacea hatch as a more highly organized form called 'zoea,' and later pass through an intermediate larval form, the 'megalops,' all pass through a nauplius stage in the egg. See BARNACLE for illustration of 'nauplius;' and see CRAB for illustrations of 'zoea' and 'megalops.'

More than 10,000 species of living Crustacea are known, of which the greater number are marine; some inhabit fresh waters, running or stagnant; comparatively few are terrestrial. Many exhibit a high degree of intelligence. The Crustacea constitute, in an economic sense, perhaps the most important group of invertebrates. The myriads of the smaller forms that drift about the ocean and the great lakes furnish the greater part of the fare of the important food-fishes, and are thus indirectly of value to mankind. In the economy of the ocean itself Crustacea are also of great importance, for they act as the natural scavengers of the sea.

CLASSIFICATION AND PHYLOGENY. Classification of the Crustacea is based upon the number and manner of consolidation of the segments of the body, and upon the number and character of the appendages. There are three large groups: (1) Trilobita, (2) Entomostraca, and (3) Malacostraca (qq.v.), which may be considered to constitute subclasses. The principal characters of these subclasses and their component orders, together with some notes of the geological history of the groups, are here briefly given.

I. TRILOBITA. This is an extinct group of Crustacea that lived during Paleozoic time only. No near relatives are known, though they exhibit some affinities with the Phyllopoda. The body consists of three regions—head, thorax, and abdomen—and it is further divided by a raised median dorsal ridge into three longitudinal lobes from which character the group derives its name. The thorax has a variable number (2 to 19) of segments that are so articulated as to enable the animal to coil itself more or less closely after the manner of an armadillo. The trilobites constitute a very primitive group of Crustacea, and, as their remains are found in the oldest sedimentary rocks, they were among the earliest inhabitants of the earth. They are of great importance to the geologist, as the various species are very characteristic of the particular layers of rock in which they occur, and for this reason they will be more fully described in an article under their own name.

II. ENTOMOSTRACA. The members of this subclass present a great variety of form and habit of life, but they are alike in the variability of the degree of segmentation of the body. They are with few exceptions small, and all are aquatic. They are divided into four orders. (1) In the order *Phyllopoda* the segmentation is distinct, the anterior portion of the body is covered by a cephalic shield, and the thoracic appendages are leaf-like, this latter character giving the group its name. In some phyllopods, as *Apus*, and the brine-shrimps (*Branchipus* and *Artemia*), the body is elongated, well segmented, partly covered by a single dorsal shield and divided into three regions. In other genera, as *Daphnia* and *Estheria*, the body is not well segmented and is enclosed in a bivalve shell articulated by a hinge at the dorsal median line. The phyllopods are

doubtfully represented in the Cambrian rocks. One genus, *Estheria*, has enjoyed a remarkably long life-period, since it has existed from Devonian to recent times. During the Devonian and Carboniferous periods the Phyllopoda abounded in the brackish waters of the coastal swamps; in the rocks of the Tertiary era the members of this order are less common. A single doubtful representative of the suborder Cladocera, the genus *Lynceites*, has been found in the Carboniferous rocks. (2) *Ostracoda*.—In this order the animals are all small, mostly microscopic, and with the body inclosed in a hinged bivalve shell that can be tightly shut by a specially developed adductor muscle. These animals occur by myriads in the modern ocean, seas, and lakes, mostly swimming near the surface of the water, and they seem to have lived in equal abundance in the seas of past time, for their fossil shells are common in all the aqueous rocks from those of Cambrian to those of recent time. Their greatest expansion was in the Ordovician and Silurian, and again in the Carboniferous and Cretaceous periods. Examples are *Beyrichia*, *Lepeditia*, and *Cypris*. (3) *Copepoda*.—These are all recent forms, with elongated well-segmented bodies in all except the degenerate parasitic members of the order. The limbs of the free-swimming species are biramous; those of the parasites are greatly reduced in size or entirely wanting. Examples: The water-flea (*Cyclops*), the fish-lice (*Lernæa*), and carp-lice (*Argulus*). (4) *Cirripedia*.—In this order, the barnacles, we see perhaps the most aberrant of all crustaceans. Because of the usual sessile habit of life, the body of the animal has suffered so great modification that only the study of the developmental stages shows that the peculiar forms of the adult barnacles are acquired after passing through a series of larval stages exactly parallel to those of other Entomostraca. The body of the adult is attached by the head. It is inclosed in a leathery integument that develops articulated calcareous plates and is raised upon a peduncle as in the goose-barnacle (*Lepas*); or it may be contained in a calcareous box made of a series of stony plates firmly joined to each other and to the foreign object that serves as a support, as in the acorn-shell (*Balanus*). The earliest members of the order, *Turritepas* and *Plumulites*, appeared in Cambrian and Ordovician time, and were ancestors of *Lepas*, while the oldest relative of *Balanus*, namely *Palæocrensia*, occurs in the lower Devonian rocks, and the genus *Balanus* itself has been found in the Mesozoic and Tertiary deposits. The Cirripedia afford the largest examples of Entomostraca in some of the goose-barnacles that attain a length of eight or nine inches, and they furnish also the most degenerate forms in those Rhizocephala that live as parasites in the bodies of crabs. See BARNACLE; COPEPODA; OSTRACODA; PHYLLOPODA; ENTOMOSTRACA; and Plate of BARNACLES.

III. MALACOSTRACA (crabs, lobsters, etc.). The most commonly known, the largest, and the most highly organized Crustacea belong to this division. The body consists of a constant number of segments (20 or 21), distributed between the head (5), the thorax (8), and the abdomen (7). In most of the orders the head and thorax are fused to form a cephalothorax of 13 segments, and each segment bears a pair of appendages, all

of which are usually well differentiated to perform special functions. The compound eyes are stalked in all orders except the Cumacea and Arthrostraca. (1) The order *Phyllocarida* was much more fully represented in Paleozoic times than it is now by such genera as *Ceratiocaris*, *Echinocaris*, *Pephracaris*, etc., in which the cephalothorax was covered by a hinged bivalve shell provided with an adductor muscle like that in the bivalve phyllopods and the ostracods. The order enjoyed a long life-period, as it first appeared in the upper Cambrian, and it lasted to the end of the Paleozoic. Through the Mesozoic and Tertiary eras the order could not have been very abundant, as no fossil remains referable to it have been found in the rocks of those ages, and the modern genera, three in number, show considerable modifications from their early ancestors. This group presents synthetic types which may have given rise on the one hand to the Phyllopoda, and on the other to the higher Crustacea represented by the Schizopoda and Decapoda. (See PHYLLOCARIDA.) (2) *Schizopoda*.—The animals of this order, the opossum-shrimps (*Mysis*), resemble in their general form the shrimps and prawns among the decapods. They are, however, more loosely built and the thoracic limbs, of which there are eight pairs, are biramous (whence the name), and all alike. These characters mark the group as of primitive rank. Its relation, as one of lower phylogenetic rank, to the Decapoda, is shown by the fact that certain decapods, such as the prawns, pass in their ontogeny, that is, in their development from egg to adult, through a 'mysis stage,' in which schizopod characteristics are strongly marked. The fossil genera *Archæocaris*, *Cran-gopsis*, and *Pygocephalus* from the Carboniferous, and possibly also *Paleocaris* and *Gampsonyx*, the latter from the Permian, are the earliest ancestors of the Schizopoda. These all present very primitive characters and are separated from the modern descendants by the interval of Mesozoic and Tertiary time, from which we have no traces of the group.

(3) *Decapoda*.—The character upon which the order (shrimps, lobsters, and crabs) is based is the prominence of the five posterior pairs of thoracic limbs developed as walking feet; the three anterior pairs being adapted as maxillipedes or accessory mouth-parts. The first pair of walking feet is usually provided with strong chela or nipping claws. The cephalothorax is covered by a single firm carapace, which in many crabs is so shaped as to afford a most efficient protective covering for the entire animal, including the legs. The frontal portion of this carapace is produced into an anterior rostrum that is often of considerable length, and the lateral portions are extended downward to cover the gills, which are borne on the bases of the thoracic limbs. The order is divided into two suborders: the *Macrura*, with long-tailed bodies, as the shrimp, prawn (*Palaemon*), and lobster (*Homarus*); and the *Brachyura*, or crabs, with the abdomen reduced and closely applied to the under surface of the cephalothorax. A number of species allied to the hermit-crab (*Pagurus*), often distinguished under the subordinal designation *Anomura*, are either *Macrura* or *Brachyura* which, through adaptation to their peculiar habits of life, in occupying the discarded shells of gastropods, have lost the regularity of their

thoracic and abdominal segments. The compound eyes of all decapods are raised on stalks, which in many crabs are developed to extraordinary lengths. Some of the largest among Crustacea are found among the decapods. As a rule the quick-swimming decapods (prawns) may be recognized by the lateral compression of the body, while the bottom crawlers have a more or less flattened form. The crabs are the most highly specialized forms of all Crustacea, and they exhibit many interesting and peculiar adaptations to habit of life. (See CRAB; LOBSTER; PRAWN; etc.) The early ancestry of the decapods is not well known for those periods previous to Mesozoic time. Some doubtful Paleozoic forms that seem to be transitional between the schizopods and decapods are *Palaepalaemon*, from the Devonian of Ohio, and *Anthrapalaemon*, from the coal-measures of Illinois, but during this era the order was greatly subordinated to other crustaceans like the trilobites and ostracods, and to the merostomates, represented by *Eurypterus*. In the Mesozoic of Europe the group attained a great development, and this continued through the early Tertiary period. Fossil decapod remains are peculiarly sparse in the American deposits of these periods. The Jurassic lithographic slates of Bavaria have afforded large numbers of finely preserved specimens of fossil decapods of many genera and species. Some of these, as *Eryon*, have modern representatives, as *Willemoesia*, still living in the abyssal depths of the ocean. Other genera, among them the prawn (*Palaemon*), began in the Jurassic and Cretaceous periods and have survived without changes of greater than specific rank throughout the succeeding ages, and are now abundant in the Mediterranean Sea and the Atlantic and Indian oceans. The *Macrura* declined toward the end of Cretaceous time and gave way to the *Brachyura*, which attained great expansion during the Eocene or early Tertiary period. In fact, the crabs were the dominant types of invertebrate life in many parts of the Tertiary seas of Europe, and their fossil remains are now found in abundance in the rocks that are relics of those seas. The Eocene deposits of the London Clay of England, those of Bavaria and Hungary, and especially those of Vicenza, in northeastern Italy, have afforded the finest specimens, nearly all of which belong to modern families.

(4) *Stomatopoda*.—This is a small order comprising nine marine genera, of which the best known is the mantis-shrimp (*Squilla*). They have the body loosely built, elongated and flattened, with an incomplete carapace that leaves the three posterior thoracic segments uncovered,

EXPLANATION OF PLATE OF CRUSTACEA. FOSSIL.

1. *Dromiopis*, a round crab from the Upper Cretaceous of Denmark. 2. *Leperditia*, an ostracod; Silurian; island of Gotland. 3. *Eger*, a prawn; Jurassic lithographic limestones; Bavaria. 4. *Xanthopsis*, a cyclometopon crab; Eocene; Bavaria. 5. *Tarrilepas*, a primitive cirriped, allied to the zoose-barnacle; Silurian; Dudley, England. 6. *Senla pennata*, a stomatopod; Upper Jura of Bavaria; A, outline of the fossil; B, dorsal view of head; C, ventral view of entire body, showing thoracic and abdominal appendages. 7. *Ceratiocaris*, a phyllocarid; Ordovician; Llanarkshire, England; showing the bivalve shell, some of the head appendages, and the segmented long abdomen with terminal spines. 8. *Palaemonia*, a barnacle, allied to the acorn-shell, included in a fossil coral of Lower Devonian age; New York State. 9. *Pephracaris*, a phyllocarid with spinose carapace; Chemung; New York State. 10. *Eryon*, a macrura; lithographic limestones of Bavaria; A, ventral aspect; B, dorsal aspect.

and with a dis-proportionately large abdomen. The five anterior pairs of thoracic limbs function as maxillipedes, the second pair being much the largest and provided with a spiny terminal segment that folds back upon the penultimate segment, like a knife-blade into its handle, to form a very efficient clasping organ. A powerful burrowing organ, developed by the union of the sixth pair of abdominal appendages with the terminal plate or telson, enables the animal to bury itself in the sandy bottoms near shore. Fossil forms of this group are rare. The earliest, *Necroscylla*, from the coal-measures of England, resembles *Squilla*. Another allied genus, *Scudda*, is found in fine preservation in the lithographic slates of the Bavarian Jurassic, and *Squilla* is found in the same horizon and in succeeding horizons of the Cretaceous and Tertiary.

(5) *Cumacea*.—Another small order of prawn-like Crustacea, in which the compound eyes are sessile and sometimes fused together, or are entirely absent. The carapace is further reduced than in the Stomatopoda, for it leaves the five posterior pairs of thoracic segments uncovered. Only two pairs of thoracic limbs function as maxillipedes, and six pairs are legs, of which two or three anterior pairs are biramous. This group is related to the Schizopoda and Isopoda; no fossil representatives of it are known.

(6) *Arthrostraca*.—In this large order the fusion of the segments is still further reduced, only one or two of the anterior being united with the head to form a rudimentary cephalothorax. These fused segments bear maxillipedes, while the remaining free segments bear legs that end in claws or are built for swimming. The two suborders are quite different in outward appearances. The *Amphipoda* have the body laterally compressed and the legs adapted for swimming and jumping, as in the sand-fleas (*Gammarus* and *Orchestia*). The *Isopoda* have the body dorsoventrally flattened, the legs adapted for crawling, and the abdominal segments are fused to form a single terminal plate. The amphipods (see AMPHIPODA) are wholly aquatic, in both marine and fresh water, and are often also found living in the damp hotsam and jetsam of the beach between low and high tides. The isopods, while generally aquatic, afford some fine examples of adaptation to terrestrial conditions in the wood-louse (*Oniscus*) and pill-bug (*Armadillidium*), which are commonly found under the bark of dead trees and in other like situations. Paleontologically the amphipods are of little importance. The earliest indisputable ancestor is *Acanthotelson*, of the Carboniferous, and the genus *Gammarus* itself is found in the Tertiary rocks. The isopods are better known in a fossil state, and the ancestors seem to have been as a rule of larger size than the recent forms. *Arthropleura* of the Carboniferous attained a length of about twenty inches. *Præareturus*, also a large form, from the Old Red Sandstone of the English Devonian, is the earliest isopod known. *Archæoniscus*, *Cyclosphæroma*, and *Eosphæroma* are other genera from the Mesozoic and Tertiary rocks that are closely allied to modern forms.

GEOLOGICAL DISTRIBUTION. The accompanying table indicates in a rough way the larger classification of the Crustacea and the distribution and expansion of the various subdivisions in past geologic times. It shows that certain types, es-

pecially the more primitive, played more important rôles in the early ages than they do at present, and that they have been superseded by the more specialized types. The letters at the heads of the vertical columns indicate the geological systems as follows: C, Cambrian; O, Ordovi-

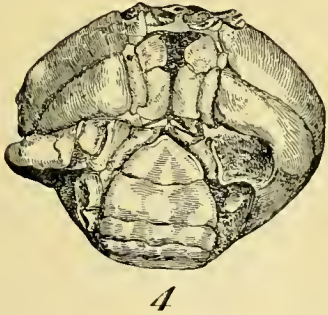
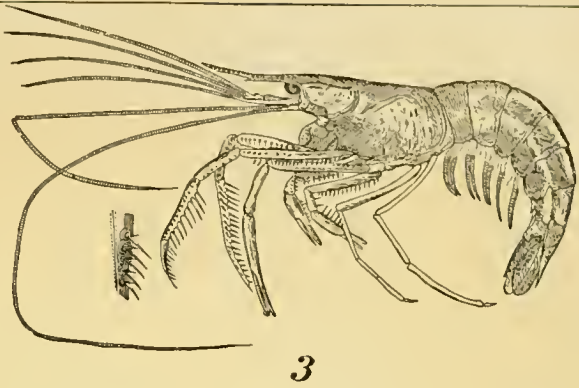
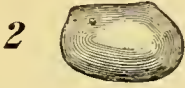
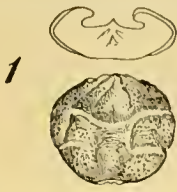
GEOLOGICAL DISTRIBUTION OF THE CRUSTACEA	Paleozoic			Mesozoic			Cenozoic				
	C	O	S D Cb	P	T	J	Cr	E	M	P	R
TRILOBITA	██████████										
ENTOMOSTRACA											
I. Order, Phyllopoda											
Suborder, Euphyllapoda	?			██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████
Suborder, Cladocera				?							
II. Order, Ostracoda	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████
III. Order, Copepoda				(Not found in a fossil state)							
IV. Order, Cirripedia											
Suborder, Eucirripedia	?			██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████
Suborder, Rhizocephala				(Not found in a fossil state)							
MALACOSTRACA											
I. Order, Phyllocarida	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████
II. Order, Schizopoda				██?							
III. Order, Decapoda											
Suborder, Macrura				██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████
Suborder, Brachyura				?	██████████	██████████	██████████	██████████	██████████	██████████	██████████
IV. Order, Stomatopoda				?							
V. Order, Cumacea				(Not found in a fossil state)							
VI. Order, Arthrostraca											
Suborder, Amphipoda											
Suborder, Isopoda											

HISTORICAL VIEW OF CRUSTACEA.

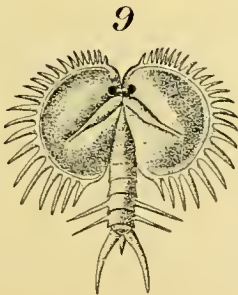
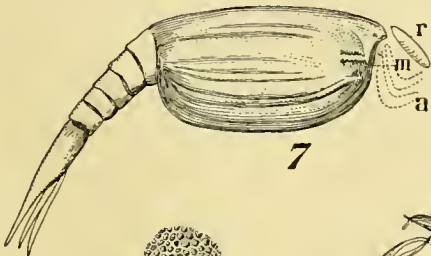
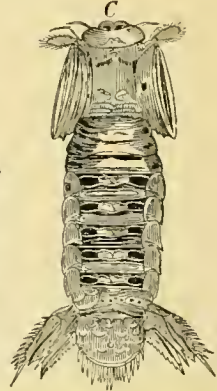
lian; S, Silurian; D, Devonian; Cb, Carboniferous; P, Permian; T, Triassic; J, Jurassic; Cr, Cretaceous; E, Eocene; M, Miocene; Pl, Pliocene; R, Recent. An interrogation-point indicates the doubtful presence of a member of the group, and the width of the black line indicates in a very imperfect way the relative amount of expansion of the group. The articles on the different orders and suborders should be consulted for further information.

BIBLIOGRAPHY. The best general introduction to the study of the Crustacea is T. H. Huxley, *The Crayfish: An Introduction to the Study of Zoölogy*, in International Scientific Series (New York, 1884). Other works of a general nature on the morphology and classification are: J. S. Kingsley, "The Classification of the Arthropoda," in *American Naturalist*, vol. xxviii. (Philadelphia, 1894); K. Groben, "The Generalogy and Classification of the Crustacea," in *Annals and Magazine of Natural History*, ser. 6, vol. xi. (London, 1893); T. R. R. Stebbins, *History of the Crustacea* (New York, 1893); R. Rathbun, "Natural History of the Economic Crustaceans," in *Bulletin U. S. Fish Commission* (Washington, 1889); H. Milne-Edwards, *Histoire naturelle des crustacés* (3 vols., Paris, 1834-40); H. Gerstaecker, "Gliederfiüssler," in *Broun's Klassen und Ordnungen des Thierreichs*,

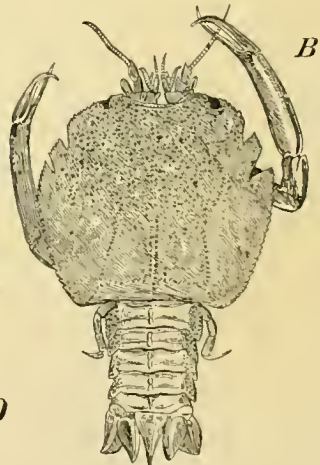
CRUSTACEA



6 A.B.C.



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vol. v. (Leipzig, 1866-94). For description of the fossil forms, consult the various manuals of paleontology, such as those by Zittel, Zittel-Eastman, Bernard, Nicholson, and Etheridge. A good synopsis of the class, dwelling more especially on the fossil forms, is to be found in Zittel-Eastman, *Text-Book of Paleontology* (New York and London, 1900), where are given very useful bibliographic lists of works on both recent and fossil forms.

CRUST OF THE EARTH. It was formerly believed by scientists that the interior of our globe is in a state of fusion due to excessive heat, and they accordingly gave the name 'crust of the earth' to the external solid portion of the earth with which we are familiar. Modern investigation has tended to show that the interior of the earth may not be liquid, as this term is ordinarily understood, and the term 'crust of the earth,' suggesting as it does the liquidity of the earth's interior, has fallen somewhat into disfavor among scientists. The term lithosphere, meaning 'rock sphere,' has been proposed as a substitute, but in popular usage it has not displaced the earlier term. The crust of the earth is composed of igneous and sedimentary rocks. The rocks occurring deepest below the surface, chiefly of the Archaean age, are igneous. Resting on them, and forming the surface rocks for much of the globe, are sedimentary rocks, which have everywhere the same general geological succession, although varying widely in minor stratigraphy and structure. The basal igneous rocks also appear at the surface over considerable areas, and other igneous rocks are associated with the sediments.

The rocks of the earth's crust are fractured and folded, the folding involving an actual plastic deformation or 'flowage' of the rock mass. It is probable that fractures are confined to the outer portion of the earth's crust, while at a considerable depth, perhaps 10,000 meters, the pressure is so great that fractures cannot be developed, and the rock is deformed by flowage. For convenience in discussing its structure, Van Hise has accordingly proposed a division of the earth's crust into (1) a deep-seated zone of flowage, where rocks are deformed by flowage, and where fractures cannot exist; (2) an upper zone of fracture, where the rocks are deformed by fracture alone; and (3) an intermediate zone of fracture and flowage. By surface erosion rocks which have been deformed in the zone of flowage may ultimately reach the surface of the earth, and hence it is that we have side by side the effects of deformation in all zones. Consult Van Hise, "Principles of North American Pre-Cambrian Geology," in *Sixteenth Annual Report U. S. Geological Survey*, pt. i. (Washington, 1896). See CLEAVAGE; ARCHAIC SYSTEM; FAULT.

CRUVEILHIER, kru'vâ'yâ', JEAN (1791-1874). A famous French anatomist. He was educated in the University of Paris, became professor of pathological anatomy at Montpellier and later in Paris. He published an excellent *Anatomie pathologique du corps humain* (1828-42), and several other works.

CRUVELLI, SOPHIE, Countess Vigier (1826-). A German singer. Her real name was Crüwell. She studied under Bordogni in Paris, made her début in Venice in 1847, and sang with increasing success in other Italian theatres, and

afterwards in London and Paris. Endowed with a soprano voice of great strength and purity, she was one of the most popular vocalists of her time. On marrying Count Vigier, in 1856, she left the stage, and thereafter lived at Nice.

CRUYS, krois, or **KRUYS**, CORNELIS (1657-1727). A Dutch rear-admiral of Norwegian extraction. He entered the service of Peter the Great in 1698, and rose to be a vice-admiral and vice-president of the Russian Admiralty Board. He served Peter faithfully in the wars with Sweden and Turkey, but was hampered by the jealousy of the native Russian officers, and in 1714, after an unsuccessful encounter with some Swedish vessels, he was arrested and tried by court-martial. Sentenced to death, he was reprieved by order of the Czar, and exiled to Kazan, but later in the year was recalled and restored to his office. As chief assistant to Count Apraxin (q.v.), Cruys did much to build up the Russian Navy. He promoted the building of dockyards, canals, and the drawing up of charts. At the time of his death in 1727, he owned a large estate at Kexholm, and the island of Birken in Finland. In memory of his work, the Russian men-of-war still fly a white flag with a blue cross (kruis). Consult: "The Russian Fleet under Peter the Great," *English Navy Records Society* (London, 1899); Browning, *Peter the Great* (London, 1898).

CRUZ, krōos, JOSÉ MARÍA DE LA (1801-75). A Chilean general. He was born at Concepción, and became a member of the Republican cadet class when ten years old. In 1838 he became chief of staff in the Peruvian campaign; was twice appointed Minister of War, and in 1842 was elected Governor of Valparaíso. In 1851, defeated as the candidate of the Liberals for the Presidency, he organized a revolution which terminated in the disastrous defeat of Loncomilla (December 8, 1851), and was followed by his retirement from public life.

CRUZ, krōoth, SAN JUAN DE LA (1542-91). A Spanish mystic, born at Fontiveros. His real name was Juan de Yepis y Alvarez, but upon entering the Order of the Carmelites (1563) he assumed that of de la Cruz (of the Cross). Saint Theresa was then engaged in the reformation of the Order of Carmel, and de la Cruz became her ardent disciple. His efforts brought him into constant trouble, and he was practically in exile at the time of his death. He was canonized in 1726. The many writings of Juan de la Cruz in prose and verse contain some passages of great beauty, and others of untranslatable vagueness. His best poem is *Noche oscura del alma*. His works, published first at Barcelona in 1580, were translated into French by P. Maillard in 1694, and have frequently been reprinted.

CRUZ Y GOYENECHÉ, krōos á gō'yâ-nâ'chá, LUIS DE LA (1768-1828). A Chilean general. He was born at Concepción, where he held several municipal offices. His exploration of the Andes in 1806 resulted in the discovery of several important mountain passes, which are described in a report published in the *Angelic Collection* at Buenos Ayres in 1835. Four years after his famous Andean expedition, he became a member of the revolutionary junta of Concepción, but was captured during the ensuing campaign, and imprisoned until 1817. He was afterwards for a time acting President of Chile, and upon

the outbreak of the Peruvian campaign joined San Martín's army (1820), advancing to the rank of grand marshal. Shortly before his death he was appointed Minister of Marine.

CRYING BIRD. See COURLAN; LIMPKIN.

CRYOLITE (Gk. *κρύος*, *kryos*, frost + *λίθος*, *lithos*, stone). A sodium and aluminum fluoride that crystallizes in the monoclinic system. It is found chiefly in west Greenland, near Arksuk, where it occurs as a large bed in a granite vein, and in El Paso County, Col. Cryolite is an important ore of aluminium (q.v.), and is used in the manufacture of alum, sodium hydrate (for making soap) sodium carbonate, and other salts. It is also employed in the making of an opaque white glass, sometimes called hot-cast porcelain, which is said to be prepared by fusing together 100 parts of silica, 35 parts of cryolite, and 15 parts of zinc oxide.

CRYOPH'ORUS (Neo-Lat., from Gk. *κρύος*, *kryos*, frost + *φέρειν*, *pherein*, to bear). An instrument consisting of a glass tube with a bulb at both ends, from which the air has been exhausted. A little water is present in one of the bulbs, and when the second bulb, containing only water-vapor, is placed in a freezing-mixture,



CRYOPHORUS.

the vapor condenses, thus producing a diminution of pressure, which causes more vapor to rise from the water in the first bulb. The result of this evaporation from the first bulb is the abstraction of much heat, and eventually the remaining water freezes.

CRYPT. *kript* (Lat. *crypta*, Gk. *κρύπτη*, *kryptē*, crypt, vault, from *κρύπτειν*, *kryptein*, to hide). A term usually employed to designate a chamber under a church, wholly or partly subterranean; but it was anciently used to mean a subterranean chapel in the catacombs. As a part of a church, it developed out of the confession (q.v.), of which it was the logical enlargement. Like the confession, its prime object was to provide a place under the high altar for the safe custody of the relics of saints; a confession became a crypt when it was large enough for an altar, with room to worship the relics. The circular passage of the larger confessions thus became a chamber occupying at least the space from the high altar in the transept to the end of the apse; like the apse—whose outline it followed—it usually had a semicircular ending. It was reached from the church by a single or a double staircase, usually in the neighborhood of the high altar in the nave or side aisles. Although some crypts existed as early as the sixth century, it was not until the Carolingian period (ninth century) that such chambers attained to any size; but from that time until the thirteenth century, they formed a very important part of church architecture, especially of the Romanesque style. They usually do not occupy more space than that which lies beneath the transept, choir, and apse of the upper church, but sometimes they extend under the entire body of the church, including nave and aisles, as in Saint

Eutrope at Saintes, the Cathedral of Otranto, and San Nicolò, Bari. In such cases it is not always easy to distinguish them from the lower section of a double or two-storied church, such as those of Saint Francis at Assisi (q.v.), the Sainte Chapelle, Paris, Le Puy-en-Velay, and Schwartz-Rheudorf. Some of the early large crypts were connected with the concentric churches of the Holy Sepulchre type, such as Saint Bénigne at Dijon, Ottmarsheim, Saint Michael's at Fulda, where the crypt has the same periphery as the church (ninth to thirteenth century). Where, as is usual, the crypt in a basilical or cruciform church extends only beneath the choir end, the pavement here is often raised above that of the body of the church, so as to give greater height to the crypt. This adds picturesqueness to the interior. Sometimes the change of level is so great that the centre of the crypt opens widely upon the nave by one long central stairway, and two side staircases ascend to the choir. In such cases the crypt is apt to be a very monumental structure. Such are the crypts of San Zeno, at Verona; of San Miniato, at Florence; of the Cathedral of Arezzo; of the Abbey Church of Saint Denis, of the Cathedral of Strassburg (the largest in Germany), and many others. The double choirs—one at each end—that were common in German churches from the time of the old Cathedral of Cologne (814-73), and the Abbey Church of Saint Gall, usually had a crypt under each choir, as existing in the Cathedral of Bamberg. In England the finest crypt is that of Canterbury; next to it, that of Glasgow Cathedral. Of course, all crypts were of necessity vaulted, in order to support the weight above. A few are tunnel-vaulted, as the example at Steinbach-Michaelstadt; but the immense majority are covered with groin-vaults, supported by a forest of columns. In Italian churches, especially in Apulia and the Roman Province, the usual division is into seven aisles by six rows of columns. Farther north, heavy piers are often substituted for the slender columns, especially when the church above is vaulted. These supports were usually placed closer together than those above. Crypts are not only interesting in themselves, and from their great variety of plan and arrangement, but because, on account of their protected subterranean situation, they have suffered less from vandalism and are often the only remaining part of a mediæval church. With the age of cathedrals and churches of the Mendicant Orders, in the twelfth and thirteenth centuries, crypts were no longer used, because the cardinal idea of this era was to provide immense interiors on a single level for large congregations, instead of interiors divided by a raised choir into two sections.

CRYPTO-CALVINISTS. A name given to Melancthon and those who agreed with him in wishing to unite the Lutherans and Calvinists, and especially in his supposed leaning toward the Calvinistic view of the Lord's Supper as shown in the difference between the original and the altered Augsburg Confession. The former said: "The body and blood of Christ are truly present in the Lord's Supper in the form of bread and wine, and are there distributed and received by the communicants; therefore the opposite doctrine is rejected." In the latter, the last clause is omitted. Luther did not approve the alteration, but tolerated Melancthon's change of doctrine. Many, however, called him

a Crypto-Calvinist. The truth seems to have been that he did not consider that either opinion was a sufficient bar to communion with Christ, and therefore thought that both of them ought to be allowed. The controversy was becoming violent before his death, but afterwards it broke out with great virulence, and continued with alternate success on each side for fifty years; during which time frequent attempts were made to suppress the Calvinistic opinions by imprisoning their leading advocates, and, at last, in 1611, by the execution of Chancellor Nicolas Crell. The term has also been applied to the Missouri Lutherans because of their acceptance of the doctrine of unconditional election.

CRYPTOGAMS (from Gk. *κρυπτός*, *kryptos*, hidden + *γάμος*, *gamos*, marriage). A general term that includes all plants below the spermatophytes (seed-plants); that is, the pteridophytes (ferns and their allies), bryophytes (mosses and their allies), and thallophytes (algæ and fungi). The name means 'hidden sex reproduction,' and, in contrast with it, the spermatophytes are often called 'phanerogams,' which means 'evident sex reproduction.' The names are not appropriate, since the sex reproduction of cryptogams is 'very evident,' and that of phanerogams is very much 'hidden.' The mistake arose from regarding stamens and pistils as sex organs. The term cryptogam, however, remains one of great convenience; but the term phanerogam is being replaced by the much more significant term spermatophyte (seed-plant). The old distinction between cryptogams and phanerogams, that the former reproduce by spores and the latter by seeds, is a false one. Both groups produce spores, but the cryptogams do not produce seeds. Since the pteridophytes are distinct from the bryophytes and thallophytes in developing a vascular system, they are very frequently called 'vascular cryptogams.' For full account, see articles under the different group-names.

CRYPTOGRAPHY (Gk. *κρυπτός*, *kryptos*, secret + *γράφειν*, *graphéin*, to write). The art of writing messages and documents in cipher, intended to be read only by those possessing the key. The use of secret methods of correspondence on important matters of state is of considerable antiquity. Plutarch and Gellius tell of a method employed by Spartan ephors in communicating with their generals abroad, which has received the name of *scytale*, from the staff used in deciphering it. A narrow strip of parchment was first wound spirally upon the staff, its edges just meeting, and the message was then written along the line of jointure. When it was unwound, the broken letters could afterwards be read only by rolling the parchment upon a duplicate staff in possession of the general to whom it was sent. This is but one of a large number of mechanical devices for reading secret dispatches, such as papers pierced with holes, to be laid over the document, revealing only such words or letters as compose the secret message.

Cryptography, in its stricter sense of the use of a cipher alphabet formed either by changing the value of the different letters, or by substituting for them groups of letters, numbers, or arbitrary symbols, if not of Semitic origin, was at least already known to, and used by, the sacred writers, in its simplest form of using the alphabet in its inverted order. By the Jews this form is known

by the name of *Atbos*, a word formed from *A*, the first letter of the Hebrew alphabet; *T*, the last letter; *B*, the second; and *S*, the last but one. An instance of its use occurs in Jeremiah xiv., where the prophet, wishing to veil his meaning from all but the initiated, writes *Shehach* instead of *Babel*, using the second and twelfth letters from the end of the alphabet, instead of from the beginning. Julius Cæsar's 'quarta elementorum littera,' in which *D* takes the place of *A*, and *E* of *B*, is only a variant of this simplest form of cipher, and Suetonius states that a like method was employed by Augustus. In mediæval and modern times, many scholars have turned their attention to cryptography, among them John Trithemius, Abbot of Sponheim, in his *Polygraphia* (1500); Anastasius Kircher, and his pupil, Kaspar Schott, whose work, *De Magia Universalis* (Würzburg, 1676), contains a cryptographic table that lies at the foundation of the modern cipher telegraph systems. It consists simply of the alphabet repeated twenty-four times in horizontal rows, each successive row dropping off one or more letters from the beginning, and adding it at the end. Thus, in the second row, *B* stands under *A*, *C* under *B*, etc. In the third *C* represents *A*, in the fourth *D* = *A*, etc. Thus correspondents have a choice of twenty-four alphabets, it being necessary only to agree between themselves upon the first or key letter. For diplomatic purposes, this form is much too simple, since any one could decipher dispatches made in this way, by the simple mechanical task of making at most twenty-four versions. Accordingly, various methods of complicating the cipher have been tried, one simple and effective way being that which is known in France as the method of Saint-Cyr. It consists in using alternately two or more of these twenty-four alphabets, the order in which they are to be used being determined by a key-word previously agreed upon. Thus, if the key-word is *Army*, four alphabets are to be used, namely those in the rows beginning respectively with *A*, *R*, *M*, and *Y*. Various other elaborations have been sometimes employed, such as arbitrarily changing the sequence of the letters of the alphabet, inserting at regular intervals letters or symbols that have no meaning, "nulls and insignificants," Bacon called them, or using groups of letters to represent separate letters. Of the last-named variety is the famous biliteral cipher of Bacon himself, consisting of various combinations of *A* and *B*, arranged in groups of five. Thus, *aabab*, *ababa*, *babba* = fly. Used in this way, such a cipher would be but little more difficult to detect than any ordinary set of single symbols. But Bacon went a step further; for the *a*'s and the *b*'s of his groups he substituted two fonts of type, differing so slightly as to present little distinction to the untrained eye. These, called respectively the *a* font and the *b* font, can be used for setting up any ordinary page of printed matter, when by the proper admixture of the two fonts, each successive group of five letters on the page may be made to stand for a single letter in Bacon's biliteral system. The fact that Bacon took a deep interest in cryptograms is probably the origin of Ignatius Donnelly's theory that the Shakespearean plays contain a cipher that if interpreted would prove that Bacon wrote them. And recently a still bolder attempt has been made by a certain Mrs. Gallup to apply the biliteral

cipher to the early Shakespeare folios, in which, as is generally known, more than one variety of type was used. The general principle involved in Bacon's method, that of representing the whole alphabet with groups and combinations of two symbols only, lies at the basis of many modern methods of signaling—the dot and dash of the Morse telegraphic code, the right and left waving of flags in military or naval signaling, etc.

In spite of the best that modern ingenuity can do to complicate cryptography, the art of deciphering cryptograms has well-nigh kept pace with it. Indeed, it is hardly too much to say that a code based upon any regular mathematical principle may be solved by ingenuity and patience. If the language of the document is known in advance, the relative frequency with which the letters of the alphabet normally occur in that language forms an important initial clue. Thus *e* is the letter of most frequent occurrence not only in our own language, but in French and German as well. In English the next in order of frequency are *t, a, o, n, i, r, s, h, d, l, c, w, u, m*, etc. Single letters must be either *a, i, o*. Words of two letters most likely to occur are *of, to, in, it, is, be, he, by, or*, etc. Double letters are most apt to be *ee, oo, ff, ll, or ss*. If there is doubt whether the cipher is in Latin, English, French, or German, the lack of double letters at the end of words suggests that it is Latin; if but few words end with double letters, it is probably French; if they are very numerous, it is German. A highly inflected language, like Latin, or even the Romance languages, with their complicated conjugations, must be easier to solve than English is, on account of the regular recurrence of the same combinations of letters in the inflectional terminations. Those who make a science of interpreting cipher documents receive no small assistance from a knowledge of the frequency with which certain symmetrical combinations of letters occur in the vocabulary of a language. Thus, the combination which may be represented for convenience by the formula *abab* is comparatively rare in English: one may cite *papa, dodo*; in French, *tête, bébé*. The form *abeba* is found in *level*; Fr., *rêver*. In German, the formula *abba* gives only *Anna, Ebbe, Egge, Esse, Otto*; in French, the formula *abcdabc* gives only two words, *cherche* and *quelque*.

Besides the writers on cryptography already mentioned, readers interested in the subject may be referred to John Baptist Porta, *De Furtivis Literarum Notis* (1563); Blaise de Vigenère, *Traité des chiffres* (1587); Thicknesse, *A Treatise on the Art of Deciphering and of Writing in Cipher* (1772); and among more modern writers, J. L. Kluber, *Kryptographik* (Tübingen, 1809); Romani, *La cryptographie dévoilée* (1875); and Fleissner, *Handbuch der Kryptographik* (Vienna, 1881).

CRYPTU'RI (Neo-Lat. nom. pl., from Gk. κρυπτός, *kryptos*, hidden + οὐρά, *oura*, tail). An order of birds, the tinamous, occupying a singular position and placed by Stejneger near the Apteryx and certain extinct forms. They differ from all other Carinate (q.v.) in the character of the palate, which is like that of the ostrich. The order contains only a single family, which includes perhaps fifty species, all found only in South America. See TINAMOU.

CRYSTAL. See CRYSTALLOGRAPHY.

CRYSTAL CLASS and CRYSTAL SYSTEM. See CRYSTALLOGRAPHY.

CRYSTALLIN. See GLOBULIN.

CRYSTALLINE LENS (Fr. *cristallin*, Lat. *crystallinus*, Gk. κρυσταλλινός, *krystallinos*, from κρυσταλλος, *krystallos*, crystal, from κρυσταναι, *krystancin*, to freeze, from κρύος, *kryos*, frost). A biconvex, transparent, solid body, situated immediately behind the pupil of the eye, and imbedded in the vitreous humor. Through it the rays of light from any object must pass to reach the retina. The crystalline lens is more convex on its posterior than on the anterior surface, and its shape and consistency vary at different periods of life. In early youth it is nearly spherical and soft; as age advances it becomes flattened and firm. In the adult human being it measures three-eighths of an inch transversely, and one-sixth of an inch in antero-posterior diameter. The lens is retained in position by a capsule of equal transparency, composed of tissue exactly similar to the elastic layer of the cornea. The lens has no vascular connection with its capsule, but is nourished by means of a very delicate layer of nucleated cells on its surface, which absorb nourishment from the capsule.

An increase in the refracting power of the eye for the purpose of near vision is called 'accommodation.' The mechanism of accommodation is as follows: The ciliary muscle contracts, drawing forward the choroid and ciliary processes and relaxing the zonula. The lens, which had been flattened by the tension of the zonula, assumes, through its own elasticity, a more spherical shape. The posterior surface of the lens alters but little in shape, being fixed rather firmly in place; but the anterior surface becomes more convex, and thus its refracting power is increased. The eye can see objects accurately at every distance between the 'far point' (the most distant point of distinct vision for that eye) and the 'near point.' The 'near point' is situated at that place at which the eye can begin to see clearly the fine print on a page held close to the eye and then moved slowly from it. Between the 'near point' and the eye vision is indistinct, because the ciliary muscle cannot, by any effort, produce the amount of convexity of the lens requisite for so short a distance. The term 'amplitude of accommodation' denotes the amount of accommodative effort it makes in order to adapt itself from its 'far point' to its 'near point.'

CRYSTALLINE ROCKS. A term used to include the igneous rocks (q.v.) and the metamorphic rocks (q.v.), both of which classes have a more crystalline texture than that of the sedimentary rocks.

CRYSTALLINE SCHISTS. See METAMORPHIC ROCKS.

CRYSTALLOGENY, kris'tal-lōj'ê-nī. See CRYSTALLOGRAPHY.

CRYSTALLOG'RAPHY (from Gk. κρυσταλλος, *krystallos*, crystal + γράφειν, *graphein*, to write). The science which treats of crystals. A crystal is a portion of inorganic matter which has a definite molecular structure, and an outward form bounded by plane surfaces called crystal faces. These faces are formed during the growth of the crystal, and have directions dependent upon the structure of the molecule of

the substance. Hence, only elementary chemical substances and definite chemical compounds form crystals. The molecular structure by which crystal shapes are conditioned is not supposed, however, to be that of the chemical molecule, but a molecular grouping of a larger order involving a number of such chemical molecules. Crystals are formed either where a molten mass solidifies by cooling, or when the amount of a substance dissolved exceeds in quantity the amount which the solvent can retain in solution under the conditions obtaining. Hence, when a solution is evaporated until supersaturated, crystals of the dissolved substance are thrown down. Solutions show, however, considerable inertness, and it is often necessary to introduce some solid substance—best of all, a crystal of the substance—into the solution, in order to start the process of crystallization. Exceptionally, crystals form directly from vapors, as in the cases of iodine and chloride of ammonia.

A substance which never forms crystals is said to be amorphous. A substance which possesses the regular molecular structure characteristic of crystals without the development of crystal faces is said to be crystalline. This condition often exists because crystals are crowded by their neighbors. The clearest proof that the regular structure is present, even when the faces are not developed, is furnished by an examination of the physical properties of the substance, for in a crystalline substance these have different values (or coefficients) for the different directions, and these values are in accord with the symmetry of the crystal faces when they are allowed to develop. For example, a sphere cut from a crystal of quartz does not, when heated, remain spherical, as would a piece of amorphous glass, but becomes distorted into a spheroid. This is due to the fact that the coefficient of expansion of the quartz is different in different directions, but is distributed with a symmetry in accord with, though somewhat different from, that of the crystal's shape.

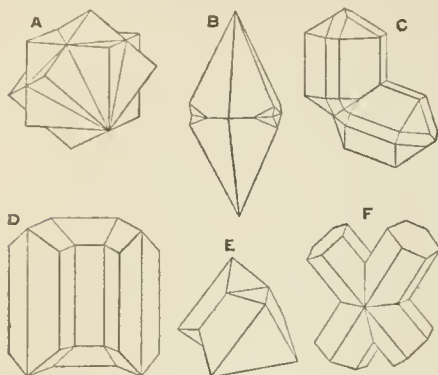
CRYSTAL FACES AND ANGLES. On every single, or individual, crystal the dihedral or interfacial angles formed by the faces are never reëntrant. Moreover, the faces of a crystal are usually of several kinds or classes, and those which are alike, or of the same kind, are said to comprise a crystal 'form.' Faces belonging in the same form, unless perfectly smooth, have similar natural markings. The angles between faces of the same kind are identical in value. The instrument used in measuring crystal angles is called a goniometer (q.v.). Not only are the angles between the similar faces of a crystal constant in value, but in crystals of the same substance, no matter where found or how produced, they are of constant value, provided only the substance is pure and the measurements are made at the same temperature. Crystal angles are, therefore, individual and characteristic for each substance, and substances may be identified by measurement of their angles. Although the angles are characteristic and definite in size in crystals of the same substance, the size and relative developments of the faces themselves may vary between the widest limits, since these depend upon the accidents of growth (the feeding of crystal substances to the enlarging crystal), and not upon the crystal's characteristic structure—the cause is external, not internal. Crystal

faces are, therefore, described in terms of their direction only, not of their absolute position in space. The groups of faces or forms which occur upon crystals of a single substance are found to have the same kind of symmetry, though as between crystals of different substances the symmetry may be quite different. Nearly all crystals have a centre of symmetry and one or more planes and axes of symmetry.

CRYSTAL CLASSES. No less than thirty-two crystal classes are called for by the mathematical theory which is based on the study of the properties of crystals. The edifice of crystal knowledge is one of the best founded in theory of any in the realm of physical science. Believing the origin of crystal structure and shape to lie in the grouping of the molecules, crystallographers set themselves the task of determining how many arrangements of points in space were possible if certain assumptions were made in accordance with properties known to be common to all crystals. It was found that thirty-two, and only that number, were possible, and, as regarded their symmetry, twenty-three corresponded exactly to the twenty-three kinds of crystal symmetry then known. It is the best possible proof of the general correctness of the theory that in the next eight years representatives were discovered among crystals of six of the nine remaining classes of crystal structure, and none were found not in correspondence with the classification. The thirty-two classes, known or possible, of crystal symmetry fall into six larger groups called 'crystal systems,' though some authors prefer to subdivide one of the systems, making the number seven. Crystal faces being described and named in terms of their directions, i.e. the relative intercepts which they make upon a system of coördinate axes, crystal systems are determined by the kinds of coördinate axes which are suited to the symmetry and which will allow of the simplest calculations. The six systems are known as (1) triclinic, which includes two classes; (2) monoclinic, which includes three classes; (3) orthorhombic, which includes three classes; (4) tetragonal, with seven classes; (5) hexagonal, with two divisions—the trigonal, seven classes; and hexagonal, five classes; and (6) isometric, which has five classes.

MODIFICATIONS. If the faces on a crystal could make any angle with the coördinate axes—any relative intercept whatsoever—the description of forms and faces would be attended with the greatest difficulty. Fortunately, however, there is found to be a law of crystals known as the *law of rational indicies*, which greatly limits the number of possible faces. This law, while empirical, finds a ready explanation in the accepted theory of regular molecular structure. Chemical replacement processes bring about change in the composition in a substance without giving opportunity of readjustment of crystal forms. Thus, substances are found to occur in forms characteristic of other substances. These false forms are known as 'pseudomorphs.' Many chemical compounds have been observed in more than one kind of crystals. Such bodies are said to be dimorphous, trimorphous, or polymorphous. It is a law, however, that for each chemical compound there is a definite kind of crystal determined by its substance, and when two or more varieties of crystal are found, it indicates that two kinds of substances exist, which chemists

have not distinguished (isomerism). Similarity in chemical composition of substances is apt to be attended with similarity of crystal form, a relationship described as isomorphism (q.v.). Two or more crystal individuals of the same kind when grown together and partially parallel are known as twin crystals.



TWIN CRYSTALS.

A, E, Isometric system; B, Trigonal system; C, Tetragonal system; D, F, Orthorhombic system.

DIVISIONS OF CRYSTALLOGRAPHY. Crystallography is treated under the separate divisions of morphological crystallography, which concerns itself with external forms of crystals; crystallogeny or chemical crystallography, which has to do with the genesis or growth of crystals; and physical crystallography, which is concerned with the physical properties of crystals. Included in this latter division of the subject is optical crystallography, the application of which to mineralogical investigation laid the foundation for the modern science of petrology (q.v.) or petrography.

Consult: Dana, *Text-book of Mineralogy*, parts i-iii (New York, 1898); Groth, *Physikalische Krystallographie* (Leipzig, 1895); Moses and Parsons, *Elements of Mineralogy, Crystallography, and Blowpipe Analysis* (New York, 1897). See MINERALOGY.

CRYSTALLOIDS (Gk. κρυσταλλοειδής, *krystatloeidēs*, like crystal, from κρυστάλλος, *krystatlos*, crystal + εἶδος, *eidos*, form). Crystals of reserve proteids in plants. They occur in small proteid granules (see ALEURONE), in the endosperm (the food-bearing tissue surrounding the embryo), and in the embryo of various seeds. Similar crystals are found free in the outer cells of potato-tubers and in certain seaweeds. Crystalloids are angular in form, but their faces and angles are inconstant. They are insoluble in water, but absorb it and swell, as ordinary mineral crystals do not. They are insoluble in weak solutions but dissolve in strong solutions of common salt. The proteid material composing crystalloids belongs to the group of globulins. See also COLLOIDS.

CRYSTALLOMANCY (from Gk. κρυστάλλος, *krystatlos*, crystal + μαντεία, *mantēia*, divination). At one time a popular practice of divination accomplished by means of transparent bodies. A transparent jewel was employed, but a beryl was deemed most effective. The operator first muttered over it certain formulas of prayer and then gave it into the hands of a youth or

virgin—none others were pure enough to discern its revelations—who read in it the information required. The desired facts were conveyed by means of written characters on the crystal, but sometimes the spirits invoked were supposed to appear in the crystal to answer the questions asked. This method of divination is still practiced by magicians. For a graphic description of its employment, consult Shorthouse, *John Inglesant* (London, 1881).

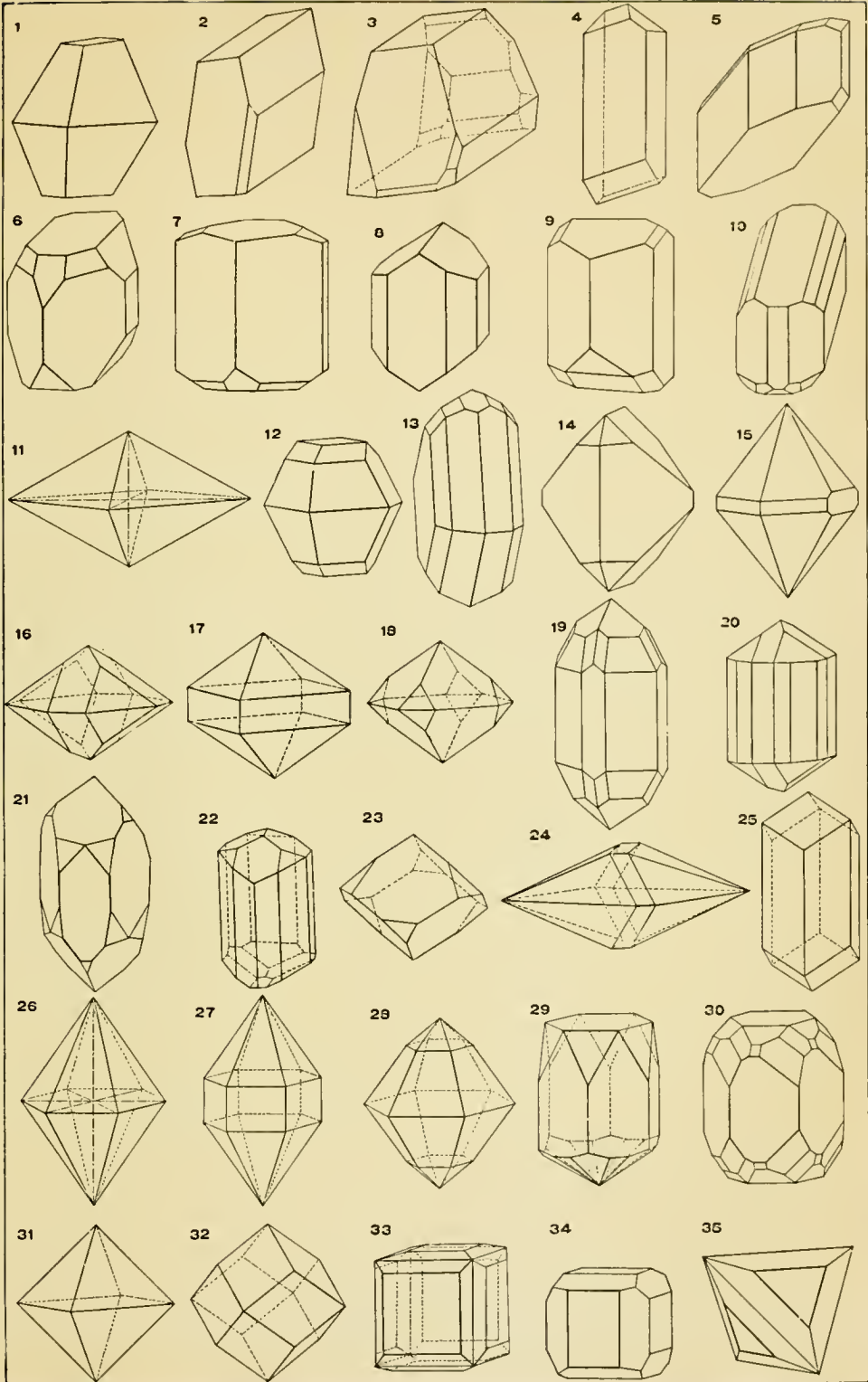
CRYSTAL PALACE (so called because made of glass). An edifice erected in Hyde Park, London, for the World's Fair held in 1851. Designed by Sir Joseph Paxton, it was built of glass and iron, with floors of wood. Its length was 1608 feet and its area 21 acres. It cost £1,450,000. Every department of art and science was represented, and the visitors numbered over 6,000,000. Its materials were removed in 1854, and the structure rebuilt at Sydenham, eight miles from London. There the park and grounds cover nearly 200 acres, and a permanent fair is held. In 1853 a similar but smaller 'crystal palace' was erected between Fortieth and Forty-second streets on Sixth Avenue, New York. It was used for exhibitions and grand concerts, but was destroyed by fire in 1858. The locality is now Bryant Park.

CSABA, chō'bō, or **BÉKÉS-CSABA**, bā'-kāsh-chō'bō, a town of Hungary, in the County of Békés, situated in a fertile district about five miles from the White Kőrös, with which it is connected by canal, and 122 miles east-southeast of Budapest (Map: Hungary, G 3). Its industries are principally agricultural, and cattle-raising, wine production, and wheat and hemp growing. The women are noted for their skill in making linen and hemp fabrics. Csaba has the largest Protestant community of any town in Hungary, excepting Budapest. Population, in 1890, 32,244, of whom less than a fourth were Hungarians, and the rest Slavs; in 1900, 37,547.

CSÁNYI, chū'nyē, LÁSZLÓ (LADISLAV) (1790-1849). An Hungarian statesman. He was born at Csány (County of Zala), and served in the campaigns of 1809-15. He early manifested an interest in local politics, and became intimate with Francis Deák. In 1848 he was appointed commissioner plenipotentiary to various divisions of the Revolutionary army, and subsequently received from Kossuth a portfolio in the Ministry. After the surrender of the Hungarian army at Világos he refused to avail himself of the opportunity for flight; but as he had previously been one of the most active organizers of the revolution, so he now became a martyr to his convictions, and after a voluntary surrender to the Russians at Sarkad, he was delivered by them to the Austrians, and executed on October 10, 1849.

CSÁRDÁS, chār'dāsh (Hung., from *csárda*, tavern). The national dance of Hungary. It consists of two movements, the first a slow *lassu* in *lied* form and in four-fourth or two-fourth time. It is mostly in the minor mode. The second movement, *friss* or *frischka*, is an exceedingly lively dance also in four-fourth or two-fourth time. It is in the major mode and consists of eight and sixteen bar phrases, which are repeated. Toward the end the time is greatly accelerated and the rhythm becomes

CRYSTAL FORMS



1-5. TRICLINIC SYSTEM.
 6-10. MONOCLINIC SYSTEM.
 11-15. ORTHORHOMBIC SYSTEM.

16-20. TETRAGONAL SYSTEM.
 21-25. TRIGONAL SYSTEM.
 26-30. HEXAGONAL SYSTEM.

31-35. ISOMETRIC SYSTEM.

more and more complex, so that the whole piece has a wild, tumultuous, and abrupt character. In both parts of the *csárdás* the accent comes on the weak beat. The alternation from the *lassu* to the *friss* is made according to the will of the dancer, who motions to the players whenever he wants the change made. The figures of the *csárdás* vary greatly in different districts. The usual form opens with a stately promenade, which changes into a rapid whirling motion; the dancers then separate and carry on a sort of pantomime, the girl sometimes approaching, then retreating from her partner, who follows and finally seizes her. Again they whirl wildly around, then separate and go through much the same performance. The dance may be performed by any number of couples, but as no two couples are ever dancing identically the same figures at the same time, the whole gives a varied and complex appearance. See MAGYAR MUSIC.

CSENGERY, chên'gê-rî, ANTON (1822-80). An Hungarian statesman and publicist. He was born at Grosswardein and early devoted himself to journalism. After editing the *Pesti Hirlap* for three years he was in 1848 appointed ministerial councillor, and followed the Hungarian Ministry to Debreczin. In 1849 he returned to Budapest and devoted himself to literary pursuits. In 1857 he founded the review entitled *Budapesti Szemle*, which he conducted for twelve years. He was an active promoter of agricultural and trade societies, and was one of the chief founders and afterwards the director of the Hungarian Institute of Land Credits. In 1861 he was elected to the Diet, where he became, as the most intimate friend of Deák, a powerful leader of the Deák party. In addition to his excellent translation of Macaulay's *History of England* (latest ed. 1874), he was the author of several important and brilliantly written works in Hungarian, among which may be mentioned: *Historical Studies and Character Sketches* (2 vols., 1870); *History and Historians* (1874); *Memorial Address on Francis Deák* (1877). His collected works were published in Budapest in 1884.

CSIKY, chê'kê, GERGELY (1842-91). An Hungarian dramatist. He was born at Pankota (Arad), and after studying Catholic theology at Budapest and Vienna became professor at the Priests' Seminary in Temesvar. After an activity here of several years, he became a convert to Protestantism in 1878. Csiky is considered one of the greatest of modern Hungarian dramatists; he was equally effective in tragedy and comedy. He also wrote several successful novels and translated into Hungarian the works of Sophocles, Euripides, and Plautus, as well as standard works of French and English dramatists. Among his numerous plays, most of which have been highly successful, may be mentioned: The comedies *Jóslat* (The Oracle), *Mukányi*, and *Kaviar*; the tragedies *Janus*, *Spartacus*, *Nora*, and *Theodora*; and the popular drama *The Proletarians*.

CSOKONAI, ehô'kô-nô-ê, VITÉZ MIHÁLY (1773-1805). An Hungarian poet, born at Debreczin. He was appointed professor of poetry in the college at Debreczin in 1794, but resigned the post in 1795, in order to study law, and, with the exception of a brief connection with the gymnasium of Csurgó, he lived thenceforth in private, devoting himself wholly to literature. His

acquirements, particularly in linguistics, were notable. In poetry he was to some extent influenced by Földi, but remained essentially independent. He was preëminently a lyricist, in both the narrower domain of the folk-song and the larger realm of artistic poetry. His diction is simple and often naïve. Some pronounced defects of taste have met with the censure of the critics, but a distinguished place among modern Hungarian poets has been conceded to him. A collective edition of his works was published by Toldy in 1846. Two specimen poems rendered into German may be found in Schwicker, *Geschichte der ungarischen Litteratur* (Leipzig, 1889).

CSOMA DE KÖRÖS, chô'mô de kô'rôsh, SÁNDOR (1784-1842). An Hungarian traveler and Tibetan scholar. He was born April 4, 1784, at Körös, in Transylvania, and was educated first at the college of Nagy-Enyed, and subsequently at Göttingen, where he devoted himself especially to the study of Oriental languages. It was the dream of his life to discover the original home of his race, the Magyars, in Asia. In 1820 he set out on his pilgrimage for that purpose. He went first to Teheran, then to Little Bokhara, and finally settled for four years (1827-30) at the Buddhist monastery of Kanam on the confines of Tibet and India, where he studied Tibetan. He found to his disappointment that the Tibetan language had little bearing on the Magyar problem, but it led him to Calcutta to study Sanskrit, as the literature of Tibet is largely translated from the Sanskrit. At Calcutta, where he became the object of general attention on the part of British scholars, he devoted himself to cataloguing the Tibetan books, upward of 1000 volumes, in the library of the Asiatic Society of Bengal. He prepared, likewise, a Tibetan grammar and dictionary (1834), which is still a standard work, and he wrote a number of articles on Tibetan literature in the *Asiatic Researches*. Once more he set out on his old-time search to find the early home of the Magyars, and bent his way toward the western confines of China, but while on this journey he died at Darjiling, north-eastern India, April 11, 1842.

CSONGRÁD, chôn'grád. A market-town of Hungary, in the county of the same name, situated on a point of land at the confluence of the Theiss and the Körös, 70 miles southeast of Budapest (Map: Hungary, G 3). The inhabitants are chiefly engaged in the rearing of cattle, fishing, and the cultivation of the vine. Population, in 1890, 20,802; in 1900, 22,619.

CTENACODON, tê-nâk'ô-dôn. One of the rare primitive fossil mammals found in the Upper Jurassic rocks of Wyoming. It is known only by its lower jaw, which has a length of about one-half inch and indicates an animal of the size of a mouse. The teeth are of the multituberculate type, and consist of a prominent chisel-shaped incisor, four longitudinally compressed premolars, which are distinctly cutting teeth with serrated edges and grooved sides, and of which the fourth is much the largest, and two small molars with tubercles surrounding the central cavities on their crowns. This type of dentition indicates relationship to the Monotremata (*Ornithorhynchus* and *Echidna*), which, together with the fossil *Ctenacodon* and its allies,

Plagiaulax and Polymastodon from the Eocene, and other Mesozoic and Tertiary genera, are included as a subclass, Prototheria: a group showing affinities to the marsupials among the metatherian mammals. Consult: Cope, "The Tertiary Marsupialia," in *American Naturalist* (Philadelphia, 1884); Marsh, "American Jurassic Mammals," in *American Journal of Science*, vol. xxxiii., ser. 31 (New Haven, 1887); Osborn, "On the Structure and Classification of the Mesozoic Mammalia," in *Journal of the Academy of Natural Science*, Philadelphia, ser. 2, vol. ix. (1888); id., "Supplementary Note on the Above," in *Proceedings of the Academy of Natural Science* (Philadelphia, 1888).

CTENOID (ténoid) **FISHES** (Gk. κτενοειδής, *ktenoieidēs*, comb-like, from *kteis*, *kteis*, comb + *eidōs*, *eidōs*, form). One of the four orders into which Agassiz classified fishes, the others being *cycloid*, *placoid*, and *ganoid*. The name refers to the scales, which bear teeth or sharp projections on the posterior or free margin. These teeth may be in one or more rows. This classification has been abandoned, since evidently unrelated forms may show this character. Such ctenoid scales characterize the more recent fishes, as perch and flounder.

CTENOPHORA, tē-nōf'ō-rā (Neo-Lat. nom. pl., from Gk. *kteis*, *kteis*, comb + *phérein*, *pherein*, to bear, carry). A class of coelenterates, composed of jellyfish, characterized by the absence of nettle-cells and the near approach to bilateral symmetry. The ctenophores are distinguished by the presence of eight external rows of minute plates, made from fused cilia, beginning near the aboral pole and running down toward the mouth, which have given the name 'comb-jellies' to this group. The body is almost transparent, and is oval, more or less elongated, rarely band-shaped, as in the girdle-of-Venus (q.v.). The gastrovascular system of canals is rather complicated and differs from that of other coelenterates by opening at the aboral pole, with two small outlets; between these is a remarkable and complicated sense-organ, which serves as an eye and a positional organ. The body is often prolonged on each side of the mouth as a flap or fold, by the movements of which the animals swim. The eight rows of so-called swimming plates are probably quite as much respiratory as locomotive. On each side of the body is a long tentacle, with branches on one side, capable of being greatly extended or completely retracted into a protecting sheath. In a few forms these tentacles are wanting. More than 100 species of ctenophores are known, all marine. The largest ones are only three or four inches in length, but the girdle-of-Venus is sometimes five feet broad. They are usually colorless, but are sometimes yellowish or brownish, and the movement of the swimming plates sometimes makes them strikingly iridescent. Many species are notably phosphorescent. Consult: L. Agassiz, *Contributions to the Natural History of the United States*, vol. iii., pt. 2 (Boston, 1860); A. Agassiz, papers in *Memoirs of the Museum of Comparative Zoology* (Cambridge, Mass., 1875 et seq.). See COELENTERATA.

CTESIAS, tēs'ī-as (Lat., from Gk. Κτησίας, *Ktēsias*). A Greek physician and historian of the fifth century B.C. He was a native of Cnidus. In B.C. 415 he was captured by the Persians, and

on account of his knowledge of medicine was kept at the Persian Court some seventeen years. In 398 he returned to his home, where he wrote a comprehensive work on Persia (Περσικά, *Persika*) in twenty-three books, based on the knowledge he had gained by his residence and researches at the Persian capital. Of this only fragments remain, and an abridgment in Photius; the latter has likewise preserved an abridgment of another work by Ctesias on India; we also hear of a geographical treatise. The fragments are edited by C. Müller in an appendix to Dindorf, *Herodotus* (Paris, 1844). Consult: Blum, *Herodotus und Ctesias* (Heidelberg, 1836); Wachsmuth, *Einführung in das Studium der alten Geschichte* (Leipzig, 1895).

CTESIBIUS, tē-sib'ī-ūs (Lat., from Gk. Κτησίβιος, *Ktēsibios*). A Greek who was famous for his inventions in mechanics. He lived about B.C. 250. He was born at Alexandria. We owe to him and his pupil, Hero of Alexandria, the force-pump, the water organ, and also the discovery of the elastic force of air, and its application as a motive power. His work on hydraulic machines is lost.

CTESIPHON, tēs'ī-fōn (Lat., from Gk. Κτησιφών, *Ktēsiphōn*), now TAK-I-KESRA. A city on the eastern bank of the Tigris, the common winter residence of the Parthian kings, and finally the capital of the Parthian kingdom. It fell into the hands of the Arabs in A.D. 637, and was later abandoned, its ruins being used to furnish material for the neighboring Bagdad. Its site is today marked by scanty remains, including, however, the façade and arched hall of the Parthian palace. On the opposite bank are the ruins of Seleucia, and the two cities are together called by the Arabs El-Modein.

CTESIPHON. An Athenian orator of the fourth century B.C. He proposed the presentation of a golden crown to Demosthenes for his sacrifices in his country's cause; for this he was prosecuted by Æschines, but was defended successfully by Demosthenes in his oration *On the Crown* (B.C. 330).

CUAUTLA DE MORELOS, kwā'ōō'tlá dá mó-rā'lōs, or **CUAUTLA MORELOS**. A city in the State of Morelos, Mexico, situated on the river Cuautla (Map: Mexico, K 8). It is the centre of a fertile sugar-growing district, and has several sugar-mills. Cuautla de Morelos was at one time the residence of the Governor of the State, and is famous for its heroic resistance under José María Morelos y Pavón in 1812 against the attacks of a superior army of Royalists. Population, about 14,000.

CUBA, kū'bā, *Sp. pron.* kōō'bā (West Indian *Cubanacan*). An island republic of the West Indies, the largest of the Greater Antilles, situated mainly between latitudes 20° and 23° N., and longitudes 74° and 85° W., and lying south of the Florida peninsula, from which it is separated by Florida Straits, about 125 miles wide, and east of the Yucatan peninsula, from which it is separated by the Yucatan Channel, of nearly an equal width (Map: West Indies, G 3, and special map). The island of Cuba lies nearly east and west; it is long and narrow, having its greatest breadth of about 100 miles at the southeast, and a width of less than thirty miles in its narrowest part, near Havana. The total length of Cuba is about 780

miles, and it has an area of 35,994 square miles, including its small islands and the Isle of Pines.

TOPOGRAPHY. The coast of Cuba is exceedingly broken, being indented by numerous gulfs or bays. The chief of these on the south coast, commencing at the west, are the following: Corrientes, Cortez, Matanaua, Cuzones, and Guacanabo. There are many fine harbors, with narrow, tortuous entrances opening within into broad expanses—as at Havana. The north coast is in great part bordered by coral islands or reefs, which stretch from Nuevitas to Cardenas, and render approach to this part of the coast extremely difficult and dangerous. On the south is the large Isle of Pines (Isle de Pinos), with many small islets associated with it, and, further eastward, a group of many islets, known as the Jardines de la Reina.

The western part of Cuba is traversed by a mountain range, Sierra de los Organos, 2500 feet high. The celebrated tobacco region, Vuelta Abajo, is on its south slope. The middle part of the island has an undulating surface, broken only here and there by hills, such as the group near Trinidad, on the south coast. The land rises eastward, and the eastern province, Santiago, consists in the main of an elevated plateau, 1000 to 2000 feet high, deeply scored by streams. Along the south coast of this province, stretching from Cape Cruz eastward, is the Sierra Maestra, much the highest land of the island, its highest peak, Turquino, being 8320 feet in height. Much of the coast west of Cape Cruz is low and marshy. The great Zapota swamp borders this coast. The rivers are numerous, but short, and in general unfitted for navigation; the river Cauto, in the southeastern part, is about 150 miles in length, and is navigable for a distance of 50 miles to Cauto Embarradero.

CLIMATE. The climate of Cuba on the coast is extremely equable, but less so inland. The average temperatures for January vary from 72° F. at the north, to 75° F. at the south, and the July temperatures average about 82° F.; the coast temperatures seldom exceed 90° F. in summer, nor go below 65° F. in winter. In the mountain regions, however, the temperature goes lower than 50°. The rainfall is excessive in the north-eastern section, reaching over 100 inches in some places; at Havana it is over 50 inches; the southern coast region has, however, much less rainfall. The chief rainy season is in summer, but rain falls throughout the year. The prevailing winds are the Trades, from the northeast. Cuba lies within the path of the West Indian hurricanes, which are liable to occur during August, September, and October. The unhealthy conditions formerly prevalent were largely due to the absence of sanitary precautions. Yellow fever, the local scourge, was an annual epidemic. Since 1901, however, the energetic administration by the military authorities of the sanitary measures recommended by a commission of American scientists has resulted in yellow fever being confined to a few isolated cases. See HAVANA; YELLOW FEVER.

FLORA. The vegetation of Cuba is tropical in its species and luxuriance, although, strangely enough, trees usually found only in colder climates are also found even in the Cuban lowlands. Thus, the pine grows side by side with the mahogany tree. Palms are plentiful. The majuga, with its fibrous bark and beautiful hard-wood

trunk, and the granadillo, the baria, Cuban ebony, lignum vitæ, Cuban cedar, Cuban mahogany, the acana, jiqui, cottonwood, logwood, rosewood, and the odd jagüey, are all indigenous. Among the economic fruit and vegetable products may be mentioned the banana, cocoanut, pineapple, orange, lemon, lime, fig, date, tamarind, mango, guava, zabote, pomegranate, anona, melon, bean, cassava, and sweet potato.

FAUNA. The fauna of Cuba includes rabbits, the hutia (q.v.), and bats; the domestic hog, dog, and cat (which have run wild and become very numerous); over 200 species of birds, including scavenger buzzards and vultures, grouse, quail, snipe, and wild turkeys; alligators, chameleons, iguanas, small lizards, and tree-toads. Few species of snakes are found, although some, like the majá, grow to large size (16 to 18 feet). The land-crabs, which move over the country in countless numbers, and grow in size up to eight inches in diameter, are very annoying, as are also the flying cockroaches. Scorpions, centipedes, and tarantulas are plentiful. Insects are numerous in species and limitless in numbers; among these are ants, beautiful fireflies, and what has been described as the 'worst pest on the island,' the nigua or jigger. Nearly 650 species of fish have been found in Cuban waters, among which are large sharks, the giant aguja (weighing sometimes 500 pounds), the snoring ronco, gallego, garfish, and the parego or red snapper. The porpoise and manatee are also found in numbers in the coast waters.

GEOLOGY. Cuba was largely formed in late Tertiary times. The rocks composing it are mainly recent stratified deposits. There are irregular areas of granite, serpentine, and eruptive rocks near the middle of the island, surrounded by Tertiary beds extending over most of the island to the coast. The Sierra de los Organos is composed mainly of Triassic sandstones, and the Sierra Maestra of Cretaceous and Tertiary beds.

MINERAL RESOURCES. The mineral deposits of Cuba are confined chiefly to the eastern province of Santiago de Cuba, and are exploited almost exclusively by American companies. The chief mineral, iron, was first worked on a large scale in 1884, and the output has since then grown at a steady rate, increasing from 23,977 tons in 1884 to 452,559 tons in 1897. The total production of iron ore for that period amounted to 3,443,444 tons, of which the United States took 3,401,077 tons. The ore is of a good quality and especially adapted for the manufacturing of Bessemer steel. In the last war with Spain, the mining industry, like all economic activities of the island, suffered greatly, in some of the mines work being completely suspended. Another mineral product of importance is manganese, which is also found in the Province of Santiago de Cuba and exported to the United States. Copper was mined in Cuba as early as the sixteenth century in the Sierra del Cobre, Santiago de Cuba; and prior to the discovery of copper in the United States the latter imported most of the copper for its domestic use from Cuba. With the increased cost of production, owing to the exhaustion of the surface deposits, and the discovery of copper in the United States, copper-mining ceased on the island. Gold, silver, and lead are found in small deposits. In general, the mining industries of the island are little developed.

AGRICULTURE. Owing to its climate and soil, Cuba is exceptionally well adapted for agriculture, but long years of political oppression and unfavorable labor conditions, combined somewhat with the indisposition for work inherent in the natives, have retarded the agricultural development of the island. Prior to the late war the number of farms was estimated at over 90,000, valued at nearly \$200,000,000. But the war, with the reconcentrado policy, caused a great destruction of farms and live stock. Thus the census of 1899 gives the number of farms at 60,711, with a total area of 8,542,000 acres, of which, however, only a little over one-tenth was under cultivation. The land is cut up into exceedingly small tracts. The holdings of less than eight acres ($\frac{1}{4}$ caballeria) constitute about 63 per cent. of the total number; those of between eight and sixteen acres comprise about 19 per cent.; while those above thirty-two acres constitute only 7 per cent. Out of the 50,000 farms of less than sixteen acres, about 24,000 are occupied by white renters, 10,300 by colored renters; 9600 are occupied by white owners, 2800 by colored. The participation of colored inhabitants in agricultural pursuits is confined largely to the smaller farms.

Sugar.—Sugar was one of the earliest products of the island. Cane is supposed to have been introduced in 1523, but its cultivation for three centuries was insignificant. The annual output prior to the opening of the nineteenth century averaged about 28,000 tons, which was increased by the end of the first half of the century to about 250,000. During the latter half of the nineteenth century also the tendency was upward, although the industry was greatly handicapped by frequent internal disturbances and by the low price of sugar, brought about largely by the competition of beet-sugar. In 1853 the output of the island was 322,000 tons; in 1870 it had increased to 726,000. Twenty years later the amount had fallen to 632,368 tons; but in 1894 there were produced 1,054,214 tons, or nearly 50 per cent. of the world's output of cane-sugar. Even in 1895, the first year of the Cuban war, the output exceeded 1,000,000 tons; but in the following year it fell to 225,221, with a further decrease in 1897 of 13,221 tons. Since the Spanish-American War the figures have grown to 335,668 tons in 1899, 300,073 tons in 1900, and 600,000 in 1901. The cultivation of sugar differs from most branches of agriculture in that it requires a large outlay of capital for its operation. The successful *colonia*, or sugar plantation, generally contains several thousands of acres, several miles of private railway for the transportation of the cane to the mills, numerous buildings, and costly plants of machinery for the manufacture of the sugar. Besides this, buildings for the housing of a thousand or more employees have to be provided. The cane, which requires replanting but once in seven years, is chiefly grown on elevated land, no fertilizer being required.

Tobacco.—Next to sugar, tobacco is the most important agricultural product of the island. The cultivation of that plant in Cuba dates from about 1580, when it was introduced into the district of Vuelta Abajo, in the Province of Pinar del Rio, which has since been famous for the quality of its tobacco. The output of the province is nearly 50 per cent. of the entire crop of

the island. The plant is also extensively cultivated in the provinces of Havana and Santa Clara. At the outbreak of the late war, the normal annual output was over 62,000,000 pounds, but in 1896-97 the amount had dwindled to about 41,000,000 pounds; in 1897-98 to 9,680,000 pounds; in 1898-99, however, it rose to 24,400,000 pounds. The condition of the tobacco industry is, on the whole, more hopeful than that of sugar, because it suffers less from competition and because the raw tobacco, although the tariff is high on the finished product, such as cigars, is admitted to the market of the United States with only a slight import duty.

Other Agricultural Products.—Corn, or maize, is grown all over the island and is used extensively for the feeding of domestic animals. Rice is also cultivated, but the harvest goes entirely to satisfy the domestic demand. Wheat, barley, and oats, chiefly for economic reasons, are little cultivated, and it is doubtful whether the output of wheat will ever meet the home demand. Sweet potatoes are raised almost everywhere and form a very important food article. The natural conditions are exceedingly favorable for the cultivation of fruit. The banana is grown in enormous quantities, and besides being extensively exported to the United States, figures very prominently in the diet of the poorer native classes. Oranges of an excellent quality also abound, and their cultivation will undoubtedly be extended owing to the recent destructive frosts in Florida. Coffee, once an important product, is now (1902) in a state of decline and the output is barely sufficient for home consumption. Pineapples, coconuts, limes, lemons, and numerous other southern fruits grow in abundance, but thus far very little has been done by the natives toward their systematic cultivation, the fruit interests being in the main in the hands of foreign (chiefly American) companies.

The forests of Cuba are supposed to occupy about 50 per cent. of the total area of the island. Besides the valuable mahogany and cedar woods which find their way to foreign markets, there are about thirty species of the palm, of which the royal palm is probably the most useful tree on the island, every part of it from the leaves and fibre to the roots being utilized by the natives. Of the forest area the State owns 1,250,000 acres.

The natural conditions for the raising of live stock are very favorable, and at one time this branch of agriculture was in a high state of development. During the decades preceding the late war, however, the heavy import duties on live stock, whose effects were aggravated by periods of rebellion, kept the supply far short of the natural demand, and most of the animals necessary for agricultural purposes and slaughtering had to be imported. In 1894 the live stock of the island numbered 584,725 horses, 2,485,766 cattle, 570,194 hogs, and 78,494 sheep, with a total value of over \$101,000,000. The effect of the late war on the live stock of the island may be seen from the census figures of 1899, which give the number of horses at 88,000; cattle, 376,650; hogs, 358,868; and sheep, 9982.

MANUFACTURES. The manufacturing industries of Cuba are confined to the production of sugar, and of cigars and cigarettes—both industries closely connected with agriculture. In fact, the first is so intimately connected with the



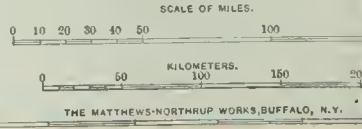
TRANSLATION.
 Bahía, Bay; Cabo, Cape; Cayo, Key or Island; Ensenada, Bay;
 Laguna, Lagoon; Puerto, Port or Harbor; Punta, Point; Río, River;
 San, Santa, Saint; Sierra, Mountain Range.

Railroads ———
 Steamer Lines - - - - -
 Submarine Telegraph Lines - - - - -

G U L F O F
 M E X I C O

C A R I B B E A N
 H A V A N A

**CUBA,
 JAMAICA
 AND THE
 BAHAMA ISLANDS.**





plantations that it is rather to be regarded as an adjunct of agriculture than a separate industry. In the case of tobacco products the line of demarcation is more distinct, and, while some of the large manufacturing companies have their own plantations, most of them prefer to buy the raw material of the planters. The centre of the cigar manufacturing is Havana, and most of the large firms are in the hands of foreigners. This industry has of late begun to show some signs of decline owing to the heavy import duties imposed by foreign countries, and the general tendency is to export Cuban tobacco in its raw state.

LABOR CONDITIONS. One of the prominent retarding factors in the agricultural and industrial development of Cuba is the scarcity of labor. The liberation of slaves had a detrimental effect on the economic development of Cuba as well as the West Indies in general. With the supply of black labor cut off, the Chinese coolies became the chief factor in the Cuban labor market, but, owing to real or alleged inhuman treatment, the Chinese Government prohibited further emigration to the island. Since then Spain and the Canary Islands have been drawn upon to some extent, but the supply falls short of the demand. The war still further depleted the ranks of labor, and according to the census of 1899 only 299,197 persons were engaged in agriculture, fishing, and mining; 93,034 in manufacturing and mechanical pursuits. To the sugar planter the problem of securing competent laborers is serious. In the tobacco industry the labor question does not offer such difficulties, owing to the fact that the work requires great skill, and white labor can be utilized to a large extent. In the mining industry the problem is also simplified, largely because of more favorable climatic conditions in the mountain districts.

TRANSPORTATION. Owing to the oblong shape of the island and the comparative evenness of the surface, the transportation problem presents few natural difficulties. The existing facilities, however, are utterly inadequate. The roads are mostly uncarred for, and during the rainy season become almost impassable. Even the *Camino Central*, the chief highway of the island running from Havana to Santiago de Cuba, is for the most part in a very poor condition. The railway lines, while exceeding in mileage the length of the island, are concentrated chiefly in the western and central parts. They are mostly narrow-gauge lines with light rails and poor roadbeds. The centre of the railway system is Havana, from which lines lead to Matanzas, Pinar del Rio, Cardenas, Cienfuegos, Santa Clara, Camajuani, and a number of minor places. East of the Province of Santa Clara there are only a few short lines, of which the most important are the one connecting Puerto Principe with its port, Nuevitas, and the few short lines leading from Santiago de Cuba into the mining region of the province. The total length of the seventeen public railways is over 1200 miles, while the 107 private roads (mostly belonging to sugar plantations) have a total length of 865 miles. The Central Railway connects Santa Clara with Santiago de Cuba, and thus gives uninterrupted railway communication from one end of the island to the other.

COMMERCE. The commerce of Cuba, under the Spanish régime, notwithstanding the restrictions placed upon it, was, relatively speaking, exten-

sive. By a system of heavy protection, which had grown out of the monopoly idea of the seventeenth century, most of the commerce was diverted into Spanish channels, although only few of the demands of the island could be supplied by Spain from its domestic products. But the adoption of a reciprocal treaty between the United States and Spain gave an impetus to commercial relations between the former power and Cuba. The exports of merchandise from the United States to Cuba rose from \$12,224,888 in 1891 to \$24,157,698 in 1893, while the imports of Cuban products into the United States increased during the same period from \$61,744,395 to \$78,706,506. With the expiration of this treaty in 1894 and the beginning of the Cuban war in the following year, the commerce of the island began to decline, and the exports and imports in 1899 amounted to \$65,000,000 and \$45,300,000 respectively, as against \$64,000,000 and \$93,000,000 in 1892. Thus the exports had remained practically the same, while the imports had fallen off over 50 per cent. The figures for 1900 showed but a slight increase over the preceding year. The principal imports into Cuba in 1900 were as follows: provisions and liquors (45 per cent.); textiles (15 per cent.); metals, manufactures, and machinery (about 9 per cent.); and live stock (about 6 per cent.). The exports for the same years consisted of sugar and its products, over 36 per cent.; tobacco and its products, 53 per cent.; the rest being made up of iron ore, fruits, wood, etc. Comparing the mean annual value of imports by countries for 1894-95 (\$67,335,800) with that for the period of 1899-1900 (\$64,965,800), we find that Spain's share fell off from about 44 to less than 16 per cent.; that of the United States increased from about 33 to over 45 per cent., while that of Great Britain practically remained the same, over 15 per cent. The export trade of Cuba for 1900 was distributed as follows: United States and possessions, 68 per cent.; United Kingdom and possessions, 12 per cent.; Spain, 2 per cent.; and Germany, 11 per cent. The United States buys almost the whole of Cuba's sugar and a large portion of her tobacco and mineral products, and sends to the island in return live stock and animal products, flour, and metal manufactures, including railway supplies. Havana was visited in 1900 by 3276 vessels of 2,078,126 tons.

BANKS. Probably no other business reflects so closely the general economic condition of a country as banking. It is therefore not at all surprising to find the banking business of Cuba in a deplorable state. Of all the banks founded in Cuba in the course of the last three decades of the past century, only two survived the Spanish-American War, viz. the Spanish Bank of the Island of Cuba and the Bank of Commerce. The former, though owned by private stockholders, was a semi-official institution under the Spanish régime, being subject to certain official regulations, and its governor appointed by the Spanish Government. It acted as fiscal agent of the Government, collecting the internal revenue, and floating the paper currency. The Bank of Commerce owes its uninterrupted, though by no means entirely prosperous, existence to its valuable railway and other properties which have helped indirectly to swell its banking business, and have yielded a revenue out-

side of that derived from its purely banking operations.

FINANCE. The history of the currency of Cuba does not differ much from the lamentable record made by nearly all of the Spanish-American countries as well as Spain. It is the story of desperate, but in the end of vain, attempts to make the fiat of Government pass for commodities of intrinsic worth in the monetary transactions of the people. For a time, such attempts succeeded, but in the end the Government was compelled to refuse its own worthless currency. This is particularly true of the paper currency of the Spanish Government, which was worth at the time of American occupation but seven cents on the dollar. Even before that event, when the Spanish Government accepted 10 per cent. of customs dues in that currency, the price rose only to 15 cents, varying between that value and 12 cents. The last issue of Spanish paper currency took place during the late war, when \$20,000,000 of paper money was put in circulation through the Spanish Bank of the Island of Cuba upon the security of \$6,330,000 (silver) deposited with the bank. In spite of having been made legal tender, the paper went at a discount from the start, and as soon as the Government had shown by its illegal withdrawal of the silver fund from the bank that it did not mean to depart from its old-time methods, the paper was repudiated throughout the island, until, as stated above, the action of the Government in accepting the paper in payment of 10 per cent. of customs dues raised it from 12 to 15 per cent. of its par value.

The standard of money in Spanish Cuba was Spanish gold, the centen or alfonsino—a 25-peseta piece—being the principal coin. In addition to that there was a large amount of silver currency. The principal silver coins in circulation were: the peso (dollar), medio peso (half-dollar), peseta (quarter-dollar), real (bit), medio real (half-dime). Since silver was not exchangeable for gold at its face value, it tended, as is always the case (see GRESHAM'S LAW), to drive the gold out of circulation. To counteract that tendency the Government by a royal decree artificially inflated the value of the gold centen to \$5.30, the real value being only about \$4.80. In 1893 the French louis, a 20-franc piece (real value \$3.86) was similarly and for the same reason inflated to \$4.24.

On taking over the island, the Government of the United States found itself in a predicament. The only rational course lay in reducing the coin to its face value and putting an end to all inflation and artificial substitutes for currency of intrinsic worth. On the other hand, the people had become accustomed to existing conditions: prices had adjusted themselves to the level of the inflated currency and all contracts had been concluded on that basis. Nevertheless, by order of the President of the United States, which took effect January 1, 1899, the United States gold dollar was declared the standard in which "all customs, taxes, public and postal dues in the island of Cuba shall be paid," and "foreign gold coins such as the Spanish alfonsinos (centen) and the French louis" are accepted at their real value, i. e. at \$4.82 and \$3.86 respectively. At the same time, since retail prices and wages have been usually fixed on the island on the basis of silver money, and in order to prevent a sudden

rise of wages to the detriment of the planters who could not expect a corresponding rise in prices of their products in the foreign markets, the Spanish silver money was also declared legal tender. The old inconveniences of a fluctuating currency were done away with by giving the coins a fixed rate in exchange for gold as follows: peso, 60 cents; medio peso, 30; peseta, 12; real, 6; medio real, 3 cents. A fixed value was also given to the bronze and copper coins, which were made legal tender for sums not exceeding one dollar. As the legal value given the silver coins by the Presidential order is somewhat below the value at which it is accepted in Spain, it becomes profitable to ship that coin to the latter country. The ultimate result of this operation will be the gradual disappearance of Spanish silver from the island without sudden distressing effects upon its industry and commerce.

During the last thirty years of Spanish sovereignty in Cuba the budget of the island remained almost stationary, at from 26,000,000 to 30,000,000 pesos. Although the entire revenue was derived from the people of the island, only about 15 per cent. of the expenditures was incurred for local needs, while about 85 per cent. went to defray 'sovereignty expenses,' that is, the expenses of the general government. The following tables serve to illustrate the budgets under the Spanish and American régimes:

AVERAGE ANNUAL BUDGET FOR THE PERIOD JULY, 1890,
TO JUNE, 1895

REVENUE	
Customs	\$11,599,270 (U. S. Standard)
Internal Revenue	5,882,205
Lotteries	2,919,945
Other Sources	2,058,305
Total.....	\$22,459,725
EXPENDITURE	
Government	\$3,634,439
Justice and Instruction.....	902,449
Finance.....	664,911
Public Works.....	880,685
Total Civil Administration ..	\$6,082,484
Army and Navy.....	6,493,281
Service of the Debt	10,334,421
Total.....	\$22,910,186
Deficit	450,461

REVENUE AND EXPENDITURES OF CUBA FOR THE FISCAL
YEAR 1900-1901

REVENUE	
Customs	\$15,945,666.42
Postal	367,950.28
Internal	658,535.92
Miscellaneous	182,736.96
Total	\$17,154,889.58
EXPENDITURE	
State and Government	\$1,756,689.53
Justice	871,152.52
Public Instruction	734,335.78
Finance	2,363,863.61
Agriculture, Industry, and Commerce.....	223,588.56
Public Works.....	1,735,231.38
Municipalities	8,226,748.39
Military Department.....	1,732,885.94
Total.....	\$17,644,494.81

The chief sources of revenue under Spanish rule were (1) taxes and excise duties, yielding less than one-fourth of the total; (2) import and export duties, which furnished about 55 per cent. of the entire revenue; (3) stamp taxes, 6 per cent. of the revenue; (4) lotteries, over 7 per cent.; (5) State property—rent and sale of public lands and rent from docks—producing about 1½ per cent. of the total revenue; (6)

miscellaneous, over 5 per cent. Thus the great bulk of taxation fell upon the consumer, while the expenditures took little account of the needs of the people. As the above table shows, the army absorbed almost 30 per cent. of the entire expenditure; nearly 50 per cent. went to pay the debt incurred by the Spanish Government, while only about one-fourth of the total went for civil administration, of which the greater part was absorbed by salaries of Spanish officers.

It will be observed that under the new régime the customs duties furnish over 90 per cent. of the entire revenue of the island. On the other hand, on the side of expenditures a radical change may be noted. The expenses of the military department have come down from nearly one-half of the total expenditure to less than 10 per cent. The service of the debt naturally disappeared from the budget because it was not the business of the United States to pay the debts incurred by the Spanish Government, and the Cuban Convention, by repudiating that debt, by one stroke of the pen relieved the people of the island of a great burden. A detailed comparison of expenditures under the two régimes is impossible owing to the different method of classification: however, a comparison of the four leading items common to both budgets shows the following changes:

The expense for State and Government decreased from \$3,634,439 to \$1,756,689.53, or 52 per cent., although the latter sum includes the cost of the census. The expense for justice and instruction, on the other hand, increased from \$902,449 to \$1,605,488.30, or 78 per cent. The finance department shows also an increased expenditure of 255 per cent., and that of public works increased from \$880,685 to \$1,735,231.38, or 99 per cent. An unusually large item, \$8,226,748, almost one-half of the total budget, is formed by the supplementary grants to municipalities. These subsidies were occasioned by the poverty-stricken condition of the people, who were unable to raise the necessary local revenue, and the money was advanced largely to defray expenditures affecting the most vital interests of the people, such as instruction, sanitation, hospitals and asylums, public buildings, etc.

As stated, the tariff has not been reduced materially, owing to the impossibility of providing other equally productive sources of revenue. At the same time, some reductions were made, especially in the case of imported food-stuffs, agricultural machinery, locomotives and rails, and the duties were made equal for all countries, the United States not excepted. This change has done away with some of the worst features of Spanish tariff, the chief purpose of which was to stifle Cuban industries and to favor the Spanish producer and merchant at the expense of the Cuban consumer even when the former could not furnish the goods demanded. As an illustration the following may be taken from the official report of the Hon. Robert P. Porter, Special Commissioner for the United States to Cuba and Porto Rico: "The Spanish exporter was able, by a discriminating duty of more than 100 per cent. against other countries, to import from Minnesota to Barcelona American flour and reship it to Cuba at a price just below the price of the American article shipped direct to Cuba, upon which a duty nearly three times

as great as that exacted from Spain had to be paid."

GOVERNMENT. The Constitution of Cuba was adopted by the Constitutional Convention, on February 21, 1901. It provides for a republican form of government, and, in its main provisions, differs but slightly from the Constitution of the United States. The President, who must be either a native Cuban or a naturalized citizen with at least ten years' service in the Cuban army during the wars for independence, is elected directly by an absolute majority for a term of four years and is disqualified for more than two consecutive terms. He has the right of appointment and removal in regard to the members of his Cabinet.

The legislative power is vested in the Congress, which consists of a Senate and a House of Representatives. The former is composed of four Senators from each province, elected by an electoral board composed of the provincial councilmen and electors, the latter being twice the number of the former and chosen by popular vote. Provision is made for the retirement of one-half of the Senators every four years. The House of Representatives consists of one member for every 25,000 inhabitants, or for a fraction of more than 12,500. They are elected directly for four years, one-half retiring every two years. Congress meets annually and is endowed with extensive powers, controlling besides the financial affairs and foreign relations of the Republic also the preparation of electoral laws for the provinces and municipalities. The approval of two-thirds of the members of both legislative bodies is necessary for a change in the Constitution.

For administrative purposes the Republic is divided into six provinces. The provincial Governors and Assemblies are elected directly for a period of three years. The provinces are independent in their internal administration, but the President has the right of interference in case of abuses of power on the part of the Governor or the Assembly. The municipalities are administered by mayors and assemblies elected directly by popular vote. The judges of the Supreme Court are appointed by the President with the approval of the Senate. The voting franchise is accorded to every male Cuban over twenty-one years of age, and not mentally incapacitated or convicted of crime, to all Spanish residents who have been on the island since April 11, 1899, and to all foreigners who have resided in Cuba since January 1, 1899. For foreigners who have arrived on the island after January 1, 1899, a five years' residence is required for naturalization.

EDUCATION. Primary education, according to the provisions of the Constitution, is free and compulsory, and the expenses are to be paid by the Central Government in case of inability on the part of a province or a municipality to maintain its primary schools. Secondary and advanced education is under the control of the State. During the Spanish régime education was controlled to a large extent by the Church, and the provisions for primary education were very inadequate. According to the census of 1899, the proportion of illiteracy among the voting population was: Cubans, 59 per cent.; and Spanish, 12 per cent. Prior to the Spanish War the total enrollment was slightly more than 36,000. With the American occupation the school system was entirely reorganized, and the facilities for teach-

ing as well as the enrollment increased with an extraordinary rapidity, so that by the middle of 1900 the number of schools was 3550 and the enrollment over 143,000. Cuba has a university at Havana. The population is Roman Catholic. The island forms one archiepiscopal diocese.

POPULATION. The population of Cuba at each census beginning with 1774 was as follows: 1774, 172,620; 1792, 272,301; 1817, 553,628; 1827, 704,487; 1841, 1,007,624; 1861, 1,396,530; 1887, 1,631,687; 1899, 1,572,797. The rate of increase varied from 34 per cent. for the period 1792-1817, to 5 per cent. for the period 1861-71. The decrease of population on account of the war must have amounted to about 270,000. The density of population ranges from 153 per square mile in the Province of Havana to 8 in the Province of Puerto Principe. Besides being the most densely populated province of the island, Havana has also the largest urban population, amounting to 77.4 per cent., against 47.1 per cent. for the entire island. According to race, the population is divided as follows: whites, 67.9 per cent. (57.8 per cent. natives); negroes, mixed elements, and Chinese, 32.1 per cent. The males constitute 54.1 per cent. among the white and 47.0 per cent. among the colored population. According to occupation the population was distributed as follows: 48.1 per cent. in agriculture, fisheries, and mining; 22.8 per cent. in domestic and personal service; 14.9 per cent. in manufacturing and mechanical pursuits; 12.8 per cent. in trade and transportation; and 1.4 per cent. in professional service.

Havana is the capital of Cuba. Following is the list of the provinces of the island:

PROVINCES	Area, square miles	Population in 1899	Population persquare mile
Havana.....	2,265	424,804	187
Pinar del Río.....	5,145	173,064	34
Mataanzas.....	3,506	202,444	58
Santa Clara.....	7,524	356,536	47
Puerto Principe.....	7,429	88,234	12
Santiago de Cuba.....	10,125	327,715	32
Total.....	35,994	1,572,797	44

HISTORY. The 'Pearl,' or 'Queen of the Antilles,' the 'Ever-Faithful Isle,' as the Spaniards used to term Cuba (from the attitude of the Cubans at the time of the Napoleonic overthrow of the Spanish Bourbons), was discovered by Columbus during his first voyage, on October 28, 1492. He landed, it is supposed, on the north coast, near Nuevitas, by the river Máximo, and believed it to be a part of the mainland, until assured by the natives that it was an island; but in 1494, on his second trip, he reiterated his previous belief and called the land Juana, after Juan, the son of Ferdinand and Isabella. Subsequently he changed the name to Fernandina, in honor of Ferdinand, and still later to Santiago, the name of the patron saint of Spain, and finally to Ave Maria, in recognition of the kind offices of the Virgin Mary; but the aboriginal name of Cuba clung to the island, and was never supplanted. A peaceable race of Indians, calling themselves Ciboneyes, were its inhabitants, living under nine independent *caciques*, and holding to a belief in a supreme being and the immortality of the soul. In 1502 Columbus visited Cuba a third time, and in 1511 his son,

Diego Columbus, fitted out a colonizing expedition of 300 men, under Diego Velásquez, who made their first settlement at Baracoa, and in 1514 founded Santiago and Trinidad, and also a place on the southern coast called San Cristóbal de la Habana, a name soon transferred to another settlement, on the northern coast, and in 1519 to the present locality. The natives, reduced to slavery by these adventurers, and employed in the cultivation of sugar-cane and other crops, were so cruelly treated, that by 1553 their race was almost extinct, notwithstanding the appeals of Las Casas, the Roman Catholic apostle to the Indians, to the home Government in their behalf. This humane missionary having observed in Santo Domingo that the negroes seemed to possess a capacity for endurance superior to that of the Indians, in order to save the latter, went so far as to suggest that negroes should be imported to take their places in the mines and cane-fields. The colonists were not slow to act upon this suggestion, and thus negro slavery gained a foothold in the Western world. The Indians of Cuba, however, did not escape the extermination which Las Casas was so anxious to avert, while the negroes were subjected to cruelties that checked their natural increase and made it necessary to recruit their numbers by constant importations. In 1537 Diego Columbus relinquished to the Crown his right to appoint a governor for the island, and Hernando de Soto was appointed, under the title of Captain-General. Havana was destroyed by the French in 1538, and again in 1554, and for a century and a half the people of the island were in almost continual fear of invasion by the French, Dutch, or English, or the pirates infesting the adjacent waters. Many laws were also made in Spain that were exceedingly disastrous to the prosperity of the island—e.g. a law prohibiting all foreigners, even Spaniards not native Castilians, from trading with or settling in the island. This led to smuggling, which was carried on largely, especially after the English captured Jamaica in 1655. Whatever importance and prosperity Cuba has attained seems to date from the Treaty of Paris, 1763, which ended the Seven Years' War during which the English had captured Havana. The island was restored to Spain, and for the rest of the century it enjoyed unusual prosperity. Las Casas, appointed Captain-General in 1790, was especially indefatigable in his efforts for the public good, removing many restrictions from commerce and promoting many useful public works. During the nineteenth century the island was ruled by a succession of Captains-General possessing almost absolute power, some of whom deserve praise for efforts to discharge their duties faithfully, while others can only be classed as oppressors, and whatever progress was made during their administrations was in spite of all obstacles mismanagement could invent—e.g. the royal decree of the *Omnimodas*, issued in 1825, which empowered Captains-General to rule at all times as if the island were in a state of siege. The United States made repeated efforts to purchase the island. In 1848 President Polk authorized the American Minister at Madrid to offer \$100,000,000, and in 1858 a proposal was made in the Senate to authorize an offer of \$30,000,000, but this was finally withdrawn. In 1854 what is known as the 'Ostend Manifesto' (q.v.), drawn up in the interest of the slave-

holding South by Buchanan, Mason, and Soulé, United States Ministers to Great Britain, France, and Spain, respectively, claimed the right of this country to annex Cuba if Spain refused to sell. Various attempts were made to secure the independence of the island and the abolition of slavery. The insurrections of 1849-51, under Lopez (q.v.), and of 1854 failed to accomplish anything, and were suppressed by the most cruel measures. The rebellion of 1868-78, however, induced the Spanish Government to promise the representation of Cuba in the Cortes by her own deputies, and a liberal party was formed to secure the fulfillment of this pledge, to encourage white immigration, and to promote free trade. In 1880 the Spanish Cortes passed an act for the abolition of slavery. The general discontent remained, however, and in 1895 led to a new and formidable revolt, to suppress which Spain sent General Martínez Campos. The insurgents, under Generals Gomez, Maceo, and Garcia, succeeded in keeping the field in spite of every effort to exterminate them; and became so bold as in February, 1896, to approach so near to Havana that the sound of their firing was heard within the capital. In the same month General Campos was recalled by the home Government, and General Weyler, a soldier reputed to be savage in his measures, succeeded him. The revolutionists were able to maintain the semblance of a government, and their conduct, as well as that of Spain, aroused for them much sympathy throughout the United States. Before the close of 1897 General Weyler was recalled and superseded by General Blanco. In the United States the criticism of Spanish methods suddenly developed into widespread and outspoken hostility to Spain upon the mysterious destruction of the American war-ship *Maine* in the harbor of Havana on February 15, 1898. Diplomatic relations became strained, and in April, 1898, owing to the apparent success of the insurrection, and justified by that, President McKinley called the attention of Congress to the situation in such words that Congress, on April 19, declared that the people of Cuba were "and of right ought to be free and independent." War followed, and by the treaty of December 10, 1898, Spain relinquished all right and sovereignty over Cuba, and the United States took temporary possession of the island and assumed all the international obligations arising from such occupation. For three years thereafter the affairs of the island were administered exclusively by the War Department of the United States, and extensive public improvements were effected. In December, 1901, after the people had adopted a constitution, a President of the Republic was elected, in the person of Estrada Palma. On May 20, 1902, the United States formally withdrew from the island, and Governor-General Wood was replaced by President Palma. See SPAIN; UNITED STATES; SPANISH-AMERICAN WAR.

BIBLIOGRAPHY. Pöcy, *Geografía física y política de la isla de Cuba* (Havana, 1858); Sivers, *Cuba, Die Perle der Antillen* (Leipzig, 1861); Pezuela, *Diccionario geográfico, estadístico y histórico de la isla de Cuba* (Madrid, 1863-67); Landeira, *Estudio sobre la geografía de la isla de Cuba* (Saragossa, 1897); Luzón, *Estudio geográfico de la isla de Cuba* (Toledo, 1897); Cabrera, *Cuba and the Cubans*, trans. by Güiterras, revised and edited by Louis E. Levy (Philadelphia, 1896); Rowan and Ramsay, *The Island of Cuba*

(New York, 1896); Hill, *Cuba and Porto Rico* (ib., 1898); Morris, *Our Island Empire* (Philadelphia, 1899); Davey, *Cuba, Past and Present* (London, 1898); Clark, *Commercial Cuba* (New York, 1898); Porter, *Industrial Cuba* (ib., 1899); Matthews, *The New-Born Cuba* (ib., 1899); Canini, *Four Centuries of Spanish Rule in Cuba* (Chicago, 1898); Clark, *Cuba and the Fight for Freedom* (Philadelphia, 1896); Halstead, *The Story of Cuba* (New York, 1898); Pepper, *To-Morrow in Cuba* (ib., 1899); Grillin and Phillips, *A List of Books Relating to Cuba* (Washington, 1898).

CUBAN FEVER. See CALENTURA.

CUBAN LITERATURE. "In Cuba everybody versifies," says the eminent critic Menéndez y Pelayo. It is certainly true that in her compositions in verse Cuba has made her most important contribution to literature in the Spanish tongue. The earliest poem known to have been written on the island is the *Espejo de paciencia* (1608) of Silvestre de Balboa, a native of the Canaries, but neither the seventeenth nor the first half of the eighteenth century produced any Cuban poet of great merit. Mention may, however, be made of the names of José Surí y Aguila (1696-1762), who wrote some religious *loas*; Mariano José de Alva and Lorenzo Martínez de Avileira, authors of *glosas* and *coplas*; an unknown poetess of Havana, who indited a little poem on the English invasion of 1762; and the cleric Diego de Campos, who commemorated the same event in his *décimas*. To another cleric of the eighteenth century, Fray José Rodríguez (*Capacho*), who likewise wrote *décimas* on various subjects, has been attributed the earliest dramatic work composed in Cuba, *El príncipe jardinero y fingido floridano*, but the bibliophile Barrera ascribes the play to one Santiago de Pita. The University of Havana was established in 1721, and at an early date in the century the first printing-press was set up. In 1790 the first newspaper, *El papel periódico*, made its appearance, and had among its most active collaborators such men of force as the teacher of philosophy José Agustín Caballero, the physician Tomás Rómay, and, above all, the poet Manuel de Zequeira. Quite a number of epigrams are due to the pen of Manuel del Socorro Rodríguez, a journalist who founded several papers elsewhere in Spanish America. The epic was attempted with little success by Count Colombini in his *Glorias de la Habana*. All thus far produced was rather verse than poetry; the first real poets of Cuba are Manuel de Zequeira (1760-1846) and Manuel Justo de Rubalcava (1769-1805). Zequeira, perhaps the most attractive Cuban poet anterior to Heredia, echoed in the colonies the note of patriotic fervor called forth in Spain by the stirring events of 1808; in the heroic strains of his *Batalla naval de Cortés*, of his *Dos de Mayo*, and his *Primer sitio de Zaragoza*, he is as much a Spaniard as Quintana and Gallego in their heroic odes (cf. his *Poesías*, New York, 1829). Rubalcava, who was bucolic in temperament, translated the *Eclogues* of Vergil, and composed some original idyls and descriptive poems (cf. the *Poesías de M. J. Rubalcava*, Santiago de Cuba, 1848).

But towering above the countless poetasters of the time, the greatest of all the poets that Cuba has yet produced was José María de Heredia (1803-39). A patriotic poet, who was exiled from Cuba because of his opposition to Spanish

government. Heredia is held in high esteem not only for his political poems like the *Himno del desterrado*, but also for his descriptive poems like the *Niágara*, the *Tcoacalli de Cholula*, and the *Tempestad*, pervaded by a melancholy sentiment, and full of most noble imagery. Among Heredia's works are many translations and imitations of the poems of English, French, and Italian writers, such as Young, Campbell, the pseudo-Ossian, Lamartine, Delavigne, Millevoye, Arnaut, Foscolo, and Pindemonte (cf. the edition of Heredia's poems and his translations and imitations of foreign dramas, published at New York, 1875; his prose *Lcciones de historia universal*, Toluca, 1831, and other prose works; and consult: Villemain, *Essai sur le génie de Pindare et sur la poésie lyrique*, Paris, 1859; J. Kennedy, *Modern Poets and Poetry of Spain*, London, 1852). Among the lesser lights must be counted Domingo del Monté, a Venezuelan, who, residing in Cuba, there composed pleasing romances, played the part of a generous patron of other poets, and strove energetically to have purity of idiom maintained in the Cuban use of the Castilian speech; Ignacio Valdés Machuca, who imitated Meléndez Valdés in his *Ocios poéticos* (1819), and also translated and imitated Jean-Jacques Rousseau; Manuel González del Valle, a teacher of philosophy, and the author of a *Diccionario de las Musas* (1827), etc. A protégé of del Monté's was the romantic spirit José Jacinto Milanés (1814-63), a man of superior powers, whose lyrics are now gently sentimental, and again madly socialistic. Milanés is also deemed one of the best playwrights that the island has had so far. His pieces include *El Conde Alarcos*, *El poeta en la corte*, *Por el río ante ó por el río*, and *A buena hambre no hay pan duro*. Pictures of manners in dialogue form are to be seen in his *Mirón cubano* (cf. the first ed. of his *Obras*, Havana, 1846; second ed., New York, 1865). Another true poet was Gabriel de la Concepción Valdés, best known by his pseudonym Plácido (1809-44). He was a mulatto and a foundling, and had but slight training, yet few Cuban lyrics will live longer than his romance entitled *Nicoteneal*, and his sonnets, *La muerte de Gessler*, *Falalidad*, and *Plegaria* (cf. the eds. of his verse, New York, 1856; and Havana, 1886). Of undisputed excellence is the work of the poetess Gertrudis Gómez de Avellaneda (1814-73). She was eminently successful as a lyric poet and as a dramatist, less so as a novelist (cf. an edition of her works, Madrid, 1869).

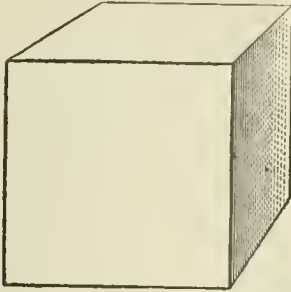
Among the countless writers of verse that have arisen in Cuba later than Avellaneda, three are of particular merit: Joaquín Lorenzo Luaces (1826-67), the author of war songs (the *Caida de Misolonghi*, etc.), of odes (see especially the *Oración de Matías* of biblical inspiration and the ode *A Cyrus Field*, on the laying of the Atlantic cable), and of one or another drama (cf. the *Poesías de J. L. Luaces*, Havana, 1857, and the *Noches literarias en casa de N. Azsárate*, Havana, 1866); Juan Clemente Zenea (1832-71), whose elegiac verse is full of a tender melancholy (cf. the complete edition of his *Poesías*, New York, 1872); and Rafael María de Mendive (1821-86), noted for his translation of the *Irish Melodies* of Thomas Moore, whose influence is also easily discernible in his original Cuban verse (cf. the *Poesías* of Mendive, Havana, 1883; and

the *Melodius irlandesas*, New York, 1875). To the list of the nineteenth-century poets there may further be added the names of Ramón Velez y Herrera (born 1808), Miguel Teúrbie de Tolón (1820-58), Francisco Orgáz (1815-73), Ramón de Palma y Romay (1812-60), Ramón Zambrana (1817-66), José Fornaris (1827-90), José Güell y Renté, etc.

As compared with her poets, it is clear that the prose writers of Cuba are distinctly inferior in importance. In the eighteenth century, she has the historians Arrati and Urtutia; in the nineteenth, Valdéz, José Arrango y Castillo, etc. Among her legal writers have figured Conde, Ayala, Armas, Bermúdez, Cintra, etc., and among her moralists and writers on philosophical matters, Barea, Veranes, José Agustín Caballero, Félix Varela, José de la Luz Caballero, etc. In the fine arts Vermay and Perouani have earned some recognition, and in music Villate has gained notice by his operatic compositions. A really good critical account of Cuban prose and poetry has yet to be written; more light on the subject may be expected from the publication of the *Biblioteca selecta hispano-cubana de prosistas* and the *Antología de poesía cubana*, which a commission of litterateurs has presented to the Spanish Academy. On Cuban lyric poets an excellent essay has been written by M. Menéndez y Pelayo and now appears as the preface to the second volume of the *Antología de poetas hispano-americanos* (Madrid, 1893), which contains very good selections from the works of the most important Cuban poets. Consult also: the *Parnaso cubano*, *Colección de poesías selectas de autores cubanos desde Zequeira*, etc. (Havana, 1881); the *Cuba poética*, *colección escogida de las composiciones en verso de los poetas cubanos desde Zequeira*, prepared by Fornaris and Luaces (2d ed., Havana, 1861); Hills, *Bardos cubanos*, *antología de las mejores poesías líricas de Heredia*, 'Plácido' Avellaneda, Milanés, Mendive, Luaces, y Zenea, with biographical notices of each of the poets and a comprehensive bibliography of their works and of Cuban poetry in general (Boston, 1901); Bachiller y Morales, *Apuntes para la historia de las letras y de la instrucción pública en la isla de Cuba* (Havana, 1860); Mitjans, *Estudio sobre el movimiento científico y literario de Cuba* (Havana, 1890); Merchán, *Estudios críticos* (Bogotá, 1886); Caleagno, *Diccionario biográfico cubano* (New York, 1878); González del Valle, *La poesía lírica en Cuba* (new ed., Barcelona, 1900).

CUBE (Lat. *cubus*, Gr. *κύβος*, *kybos*, cube), or REGULAR HEXAHEDRON. A regular solid with six square faces, each of which is parallel to the one opposite to it. It is a form of frequent occurrence in nature, especially among crystals. The cube or third power of a number is the product formed by taking the number three times as a factor, e.g. the cube of 4, or $4^3 = 4 \cdot 4 \cdot 4 = 64$. This use of the term arises from the circumstance that the solid contents of a cube may be expressed by the third power of the number which expresses the length of one of its edges. Thus, if the edge of a cube is 4 inches, its volume is $4 \cdot 4 \cdot 4 = 1$ cubic inch, or 64 cubic inches. The cube root of a number is one of the three equal factors of the number: e.g. the cube root of 8 is 2, since $2 \cdot 2 \cdot 2 = 8$. The number of which the root is sought is called the power, and

if it is a power of a commensurable (q.v.) number, it is called a perfect power. Roots of perfect powers are often readily obtained by factoring; e.g. to find the cube root of 216: $216 = 6 \cdot 6 \cdot 6$, therefore 6 is the cube root of 216. If the root is incommensurable, the binomial formula, logarithms, or the equation (q.v.) is available. Every number which satisfies the



equation $x^3 = 1$, or $x^3 - 1 = 0$ is a cube root of 1. But $x^3 - 1 = 0$ is the same as $(x - 1)(x^2 + x + 1) = 0$, and equating each factor to 0 and solving, $x = 1, -\frac{1}{2} + \frac{1}{2}\sqrt{-3}, -\frac{1}{2} - \frac{1}{2}\sqrt{-3}$, the three cube roots of unity. (See COMPLEX NUMBER.) The three cube roots of 8 are

$$2, 2(-\frac{1}{2} + \frac{1}{2}\sqrt{-3}), 2(-\frac{1}{2} - \frac{1}{2}\sqrt{-3}).$$

Thus any number has three cube roots, one real and two imaginary. In extensive calculations, tables of roots and of logarithms are employed.

Duplication of the cube or the Delian problem, according to tradition, originated with the oracle of Delos, which declared to the Athenians that a pestilence prevailing among them would cease if they doubled the altar of Apollo—i.e. replaced his cubical altar by another of twice its contents. The problem reduces to the solution of the continued proportion $a : x = x : y = y : 2a$, or to the solution of $x^3 = 2a^3$. This was effected geometrically by Hippocrates, Plato, Menæchmus, Archytas, and others, but not by elementary geometry. This is one of the three great problems whose appearance has been of wonderful significance in the development of mathematics. Consult: Gow, *History of Greek Mathematics* (Cambridge, 1884); Klein, *Vorträge über ausgewählte Fragen der Elementargeometrie* (Leipzig, 1895); *Famous Problems of Elementary Geometry*, trans. by Beman and Smith (Boston, 1897).

CUBEBES, or **CUBEB PEPPER** (Fr. *cubébe*, from Ar. *kabāba*). The dried unripe berries of *Piper officinalis*, a species of climbing shrub of the natural order Piperaceæ, very closely allied to the true peppers. *Piper officinalis* is a native of Penang, Java, New Guinea, etc., and is said to be extensively cultivated in some parts of Java. Its spikes are solitary, opposite to the leaves, and usually produce about fifty berries, which are globular, and, when dried, have much resemblance to black pepper, except in their lighter color and the stalk with which they are furnished. *Piper canina*, a native of the Sunda and Molucca islands, is supposed also to yield part of the cubebes of commerce, and the berries of *Piper ribesiodes* possess similar properties. Cubebes are less pungent and more pleasantly aromatic than black pepper; they are used in the East as a condiment, but in

Europe chiefly for medicinal purposes. They act as a stimulant, and are sometimes found useful in cases of indigestion; also in chronic catarrh and in many affections of the mucous membrane, particularly those of the urino-genital system. The chief constituents of cubebes are a volatile oil, resin, cubebic acid, cubebin, and wax. Cubebes are administered in many ways. For illustration, see Plate of CYPRESS, ETC.

CUBE ROOT. See CUBE; INVOLUTION.

CUBIC EQUATION. A rational integral equation of the third degree is called a cubic equation. It is called binary, ternary, or quaternary according as it is homogeneous of the third degree in two, three, or four unknowns. The general form of a cubic equation of one unknown is $ax^3 + bx^2 + cx + d = 0$. It is shown in algebra that this equation can be reduced to one of the form $x^3 + px + q = 0$. Every cubic equation of this form has three roots, of which one is real and the others real or imaginary. The roots will all be real when p is negative, and

$\frac{p^3}{27} > \frac{q^2}{4}$. This is known as the irreducible case in solving the equation. Only one root is real when p is positive, or when it is negative and $\frac{p^3}{27} < \frac{q^2}{4}$. If p is negative and $\frac{p^3}{27} = \frac{q^2}{4}$, two of the roots are equal. The cubic equation may be solved by the following formula, due to Tartaglia and Ferro, Italian mathematicians of the sixteenth century, but known as Cardan's formula:

$$x = \sqrt[3]{-\frac{q}{2} + \sqrt{\left(\frac{q^2}{4} - \frac{p^3}{27}\right)}} + \sqrt[3]{-\frac{q}{2} - \sqrt{\left(\frac{q^2}{4} - \frac{p^3}{27}\right)}}$$

Besides Ferro, Tartaglia, and Cardan, Vieta, Euler, and others contributed to the early theory of cubic equations. In case the roots of a cubic equation are all real their values are more readily calculated by means of trigonometric formulas—e.g. assume $x = n \cos a$, and the equation $x^3 + px + q = 0$ may be expressed by $\cos^3 a$

$+ \frac{q}{n^2} \cos a + \frac{q}{n^3} = 0$. But from trigonometry $\cos^3 a - \frac{3}{4} \cos a - \frac{\cos 3a}{4} = 0$; therefore, equating corresponding coefficients of $\cos a$, and solving the equations, $n = \sqrt[3]{-\frac{4p}{3}}$ and $\cos 3a = -4q$

$\left(-\frac{3}{4p}\right)^{\frac{2}{3}}$. Hence x may now be computed from

$$x = n \cdot \cos a; n \cdot \cos\left(\frac{2\pi}{3} + a\right); n \cdot \cos\left(\frac{2\pi}{3} - a\right)$$

For history and methods, consult Matthiessen, *Grundzüge der antiken und modernen Algebra der literalen Gleichungen* (Leipzig, 1896). See also **CARDAN**, **JEROME**.

CUBICULUM (Lat., bedroom, from *cubare*, to lie down). A term used to designate a small room or cell in a Roman house, containing a bed or couch, and opening off the court; also a recess or alcove, a box at the theatre or circus; and lastly, a final resting-place or burial-recess for one or more bodies in the early Christian catacombs.

CUBIT (Lat. *cubitus*, elbow). A measure employed by the ancients, equal to the length of the arm from the elbow to the tip of the middle finger. The cubit of the Romans was about 17 $\frac{3}{4}$ inches, and that of the Hebrews 22 inches, but its length is now generally stated at 18 English inches.

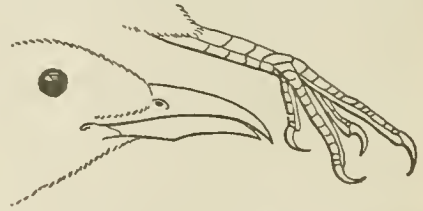
CUBITT, Sir WILLIAM (1785-1861). An English civil engineer, born at Dilham, Norfolk. In 1800-04 he was apprenticed to a cabinet-maker at Stalham, and at Swanton was associated with a manufacturer of agricultural machines and devised self-regulating sails for wind-mills. In 1818 he began the manufacture of his invention known as the treadmill, which was quickly introduced into the principal jails of Great Britain. From 1826 he was connected as engineer with important works in the improvement of canals and rivers, and the construction of bridges and railways. He conducted the improvement of the Severn and the building of the Southeastern Railway. The water-works of Berlin were also executed by him. In 1850-51 he was president of the Institution of Civil Engineers.

CUCKOO. кукуу (Fr. *coucou*, Lat. *cuco*, Gk. *κόκκυξ*, *kokkyx*, cuckoo, Skt. *kōkila*, cuckoo). A name given to many birds of the picarian family Cuculidae, which contains about 175 species, mostly confined to the warmer regions of the globe, although some of them are summer visitors to cool climates. Only 35 of the known species live in the New World. The beak is slightly compressed and somewhat arched; the tail long, rounded, and usually of ten feathers; the wings rather long; the tarsi short, with two toes directed forward and two backward, the outer hind toe capable of being brought half round to the front. The feet are thus adapted for grasping and moving about upon branches rather than for climbing.

Cuckoos of the Old World.—The name cuckoo is derived from the note of the male of the common European cuckoo (*Cuculus canorus*), which, although monotonous, is always heard with pleasure, being associated with all that is delightful in returning spring. A similar name is given to the bird in many languages. This common cuckoo is very widely diffused, as it is also found in India, Africa, and, in summer, even in Lapland and Kamchatka. It appears in Great Britain in April, and all except the young birds are believed to migrate southward again before the middle of August. The adult cuckoo is about a foot in length; ashy-gray, barred beneath with black; the wings are black, and the tail is black, marked with white. It frequents both cultivated districts and moors. There is no pairing or continued attachment of the male and female; and the female, after having laid an egg on the ground, takes it in her mouth and deposits it, by means of her beak, in the nest of some other smaller bird, leaving the egg to be hatched and the young one to be fed by the proper owners of the nest. This egg is very small for so large a bird, not larger than a skylark's; and the number laid is uncertain. The young one, soon after hatching, acquires size and strength enough to eject from the nest any eggs or young birds—the true offspring of its foster-parents—which may remain in it, and it seems restless and uneasy till this is accom-

plished. It works itself under them, and then jerks them out by a motion of its rump. Other species of cuckoo, closely allied to the European cuckoo, inhabit Africa, Asia, and Australia, and have essentially the same habits, one, about the Mediterranean, victimizing pies alone, its eggs having a remarkable resemblance to those of the magpie. Equally parasitic are many Old-World tropical species of various other genera; yet some of them (see CUCKAL) do not shirk parental responsibility, but incubate and rear their own offspring. This extraordinary practice of bird parasitism, in respect to its facts and probable origin and development, is thoroughly discussed by A. Newton, *Dictionary of Birds*, article "Cuckoo" (London, 1896).

The American cuckoos represent three different subfamilies—the anis, the road-runners, and the tree-cuckoos. The last compose the group Coccyzinae, and are characteristic of and confined to America. The best-known species are the black-billed cuckoo (*Coccyzus erythrophthalmus*) and the yellow-billed (*Coccyzus americanus*). Both species occur commonly in summer throughout the United States and eastern Canada, but pass the winter in Central and South America. The black-billed cuckoo does not occur west of the Rocky Mountains. The two species are of about the same size, a foot long, and are olive-brown above, white beneath, but are easily distinguished by the color of the bill and the amount of white on the tail.



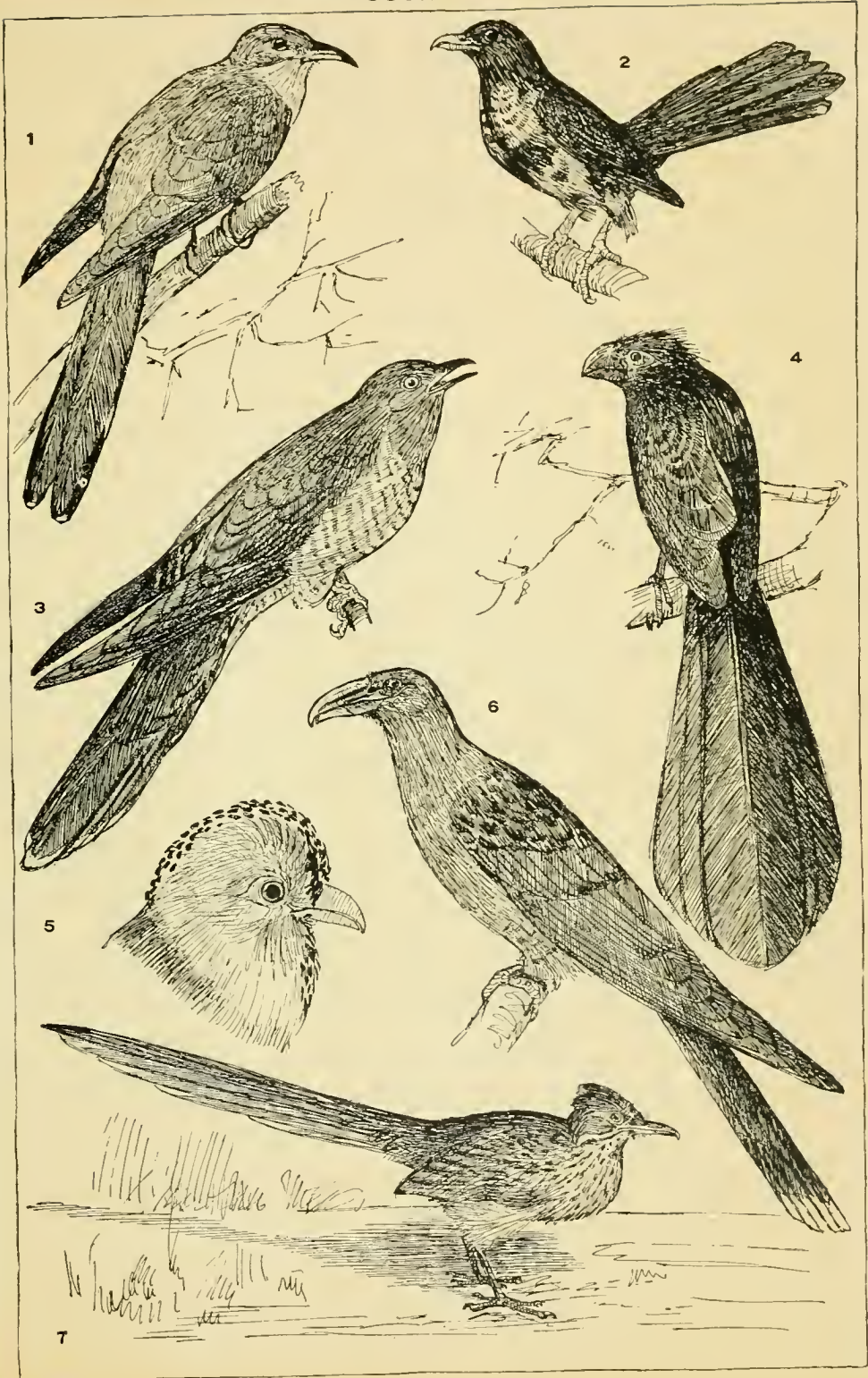
YELLOW-BILLED CUCKOO.

Unlike the Old-World cuckoos, they are not parasites, but build their own nests and incubate their own eggs. The nests are flimsy structures of twigs, the eggs large and pale blue. Incubation begins when the first egg is laid, so that no two of the eggs or young are in just the same stage of development. The American cuckoos are insectivorous and are very useful birds. Their note or call is a series of accelerated 'chucks,' not exactly harsh, but far from musical. In the Middle, Western, and Southern States the yellow-bill is known as 'rain-crow,' because its note is supposed to predict rain—an idea prevalent in regard to these birds in other parts of the world. Consult Beal, *Food of Cuckoos* (Department of Agriculture, Washington, 1898). See Plate of Cuckoos: and Colored Plate of EGGS OF SONG-BIRDS.

CUCKOO AND THE NIGHTINGALE, THE. A poem attributed in the sixteenth century to Chaucer, but probably not composed by him. The subject is the discussion between a nightingale and a cuckoo on the comparative blessings of love.

CUCKOO-BEE. A naked, somewhat wasp-like bee of the family Nomadidae, all the many species of which are parasitic in the nests of other bees, after the manner of the European

CUCKOOS



1. AMERICAN YELLOW-BILLED CUCKOO (*Coccyzus Americanus*).
 2. BLUEHEADED KOEL (*Eudynamis cyanocephala*).
 3. COMMON EUROPEAN PARASITIC CUCKOO (*Cuculus canorus*).

4. ANI, or RAIN CROW (*Crotophaga ani*).
 5. CRESTED CUCKOO (*Lepidogrammus Cummingi*).
 6. CHANNEL-BILL (*Scythrops Novæ-Hollandiæ*).
 7. CHAPARRAL COCK (*Geococcyx Californianus*).

cuckoo. Each genus makes its home with some particular form or forms of wild bee; thus, our common *Nomada imbricata* is found in nests of *Andrena* and *Haliectus*; *Stelis* lives on *Osmia*, etc. These inquilines have no means of collecting or carrying pollen, and so have been forced to seek the hospitality of forms able to do so. The investigations of J. H. Emerton show that this forced association arouses no quarreling, but that there is frequently enough food for the larva of both the proper owner of the cell and of the guest, whose egg is laid in the same pollen-mass. The cuckoo-bee flies about with its host, and enters and leaves the home without hindrance. See BEE; CUCKOO-FLY.

CUCKOO-FLY. One of a family (*Chrysididæ*) of diminutive, beautiful, metallic-green wasps, in which the abdomen has only three, four, or five visible segments, and can be turned under the thorax and closely applied to it. This 'fly' seeks out the nest of a solitary wasp or bee, and, when the rightful owner is absent collecting food, the cuckoo-fly deposits an egg in each cell. These eggs are walled in by the bee, together with her own eggs. The cuckoo-fly larvæ hatch, eat the food stored up in the cell by the bee, and perchance even the rightful larvæ. The adult fly, when seen by the wasp, is fought desperately, and during such encounters it rolls itself up in a defensive ball. In Europe, where the Germans call them *Goldwespen*, one of the cuckoo-flies is parasitic on the currant-worm.

CUCKOO-SPIT. See FROG-SPITTLE.

CUCU'JIDÆ (Neo-Lat. nom. pl., from *Cucujus*, of South American origin). A large family, chiefly tropical, of oblong, flattened beetles, most of which live under bark. See CORX-INSECTS.

CUCUMBER (OF. *cocombre*, Fr. *concombre*, from ML. *cucumer*, from Lat. *cucumis*, cucumber), *Cucumis sativus*. A common garden vegetable, native of Asia, and cultivated from the earliest times. The plant is vine-like, and somewhat similar in appearance to the muskmelon. The oblong fruit (4 to 30 inches long) is eaten in the green state as a salad, and is extensively used for pickling. The smaller sorts of pickling cucumbers are sometimes called gherkins. The many varieties of cucumber in cultivation differ greatly in size and shape of the fruit. Cucumbers are very sensitive to frost. They are grown during the warm months in nearly all parts of the United States. The seeds are planted in hills 4 by 6 feet apart. The soil should be a fertile, warm loam, and the hills made rich with a few shovelfuls of well-rotted manure. The long English varieties extensively used for forcing in Europe are less used in America, the white-spine varieties being used more extensively for this purpose. To this genus belong other species valued for their edible fruit. *Cucumis anguria* is known as the West Indian gherkin. The snake cucumber (*Cucumis melo*, variety *flexuosus*) grows to a great length, and is similar in quality to the common cucumber. *Cucumis serotimus* is cultivated in Turkey; *Cucumis macrocarpos* in Brazil; the comonom (*Cucumis cononum*) is much cultivated in Japan. The dudaim (*Cucumis dudaim*) is very generally cultivated in gardens in the East, for the fragrance of its fruit. The musk cucumber is *Cucumis moschata*.

CUCUMBER-BEETLE. Of several beetles whose grubs attack cucumbers, the most important ones are described under MELON INSECTS (q.v.). An especial flea-beetle found about cucumber-vines is *Haltica cucumeris*, which is about the size of a small grain of wheat, black, with clay-colored antennæ and legs. The larvæ mine the seed-leaves of the young plants, and both old and young feed upon the mature vine-leaves and also upon other garden vegetables.

CUCUMBER DISEASES. The cucumber is subject to the attack of a number of fungi, only the more important of which can be mentioned. In the seed-bed it is liable to the attack of *Pythium debaryanum*, the disease being called 'damping off' (q.v.). In the field one of the worst pests is *Plasmopara*, or *Peronospora cubensis*, producing mildew. It attacks the foliage, causing the leaves to turn yellow, to wilt, and die, the whole vine being involved. Spraying with some fungicide (q.v.), as Bordeaux mixture or potassium sulphide, will prevent this disease if applied early and often. Care must be taken to spray the mixture upon the under sides of the leaves. In addition to cucumbers, this mildew occurs on muskmelons, squashes, and pumpkins. Another fungus, *Cladosporium cucumerinum*, attacks the fruit of the cucumber and melons, producing upon the young fruits small, sunken areas that later become black, rotten places. Often a sort of gummy exudation is associated with this disease. The treatment given above is recommended for this disease. In the greenhouse the most serious trouble to cucumber-forcing is the powdery mildew (*Erysiphe cichoracearum*). It may be known by the white, flour-like splashes on the leaves. The leaves become yellow, then brown, and dry up, killing the plant. The disease spreads with great rapidity, but may be kept under control as in the above cases. A disease known as the wilt disease is often of great destruction to cucumbers, melons, etc. It is caused by a kind of bacteria to which the name *Bacillus tracheiphilus* has been given. The organisms fill the water-ducts of the plant, causing it suddenly to collapse. The leaf-blades shrivel and dry up, and later the petioles and stem become flaccid and the whole plant perishes. If a stem be cut across, a sticky, milk-white substance exudes. The disease is readily produced by inoculation, and is largely spread through the agency of insects. A somewhat similar disease is caused by a species of *Fusarium*, a fungus.

CUCUMBER-INSECTS. See MELON-INSECTS.

CUCUMBER-TREE. An American forest-tree, growing in nearly all the Eastern States. The fruit, which looks like a cucumber, when macerated in spirit, makes a bitter tonic drink. The timber is light and useful for boat-building. See MAGNOLIA.

CUCURBITACEÆ (Neo-Lat. nom. pl., from Lat. *cucurbita*, gourd). An order of dicotyledonous plants (the gourd family), consisting chiefly of herbaceous plants, natives of the warmer parts of the world, having succulent stems which climb by means of lateral tendrils, the morphology of which has been a subject of much contention. The flowers are monocious or dioecious, and often sympetalous. The calyx and corolla are five-parted and more or less co-

hesive. The stamens exhibit a number of peculiarities, in some cases having bilocular anthers; in others various modifications are shown, the anthers adhering in some and even becoming united into a column with two ring-shaped pollen-chambers in the genus *Cyclanthera*. The fruit, called a pepo, is peculiar; is more or less succulent, has a fleshy rind, and the seed-bearing placentæ either surround a central cavity or send prolongations into it. The seeds are flat, and more or less imbedded in the pulp, which may be dry or juicy. The cotyledons are large and leaf-like. This order contains nearly 90 genera, with about 650 species, many of which produce edible fruits and are cultivated in temperate regions. To this order belong the cucumber, melon, gourd, pumpkin, squash, vegetable marrow, etc. (qq.v.). In some, important medicinal properties abound, as in bryony, colocynth, momordica, etc. (qq.v.). *Telfairia pedata*, a tropical African species, is cultivated for its seeds, which are used for food, and from which oil is expressed. The chief genera are *Fevillea*, *Telfairia*, *Melothria*, *Luffa*, *Byronia*, *Cucumis*, *Lagenaria*, *Cucurbita*, *Echinocystis*, *Sicyos*, *Seschium*, and *Cyclanthera*.

CÚCUTA, koo'koo-tá. See SAN JOSÉ DE CÚCUTA.

CUDBEAR. See ARCHIL.

CUDDALORE, kũd'dá-lór', or **KUDALUR**, kũd'á-lóor'. The chief town in the southern division of Arcot, Madras, British India, on the estuary of the Southern Pennar, 15 miles south of Pondicherry and 100 south of Madras by rail (Map: India, D 6). The river, obstructed by a bar, admits only vessels of moderate size; but there is good anchorage a mile and a half off shore. There are a number of sugar-refineries, oil-presses, and paper-mills, and an extensive export trade in cotton and grain. Cuddalore was the scene of exciting struggles between the French and the English from 1758 to 1795, when it was finally acquired by the latter. Population, in 1891, 47,400; in 1901, 51,900.

CUDDAPAH, kũd'dá-pá'. See KADAPA.

CUD'DY. In Spenser's *Shepherd's Calendar*, the shepherd to whom Colin Clout directs his arguments.

CUDILLERO, koo'dé-lyá'ró. A maritime town in the Province of Oviedo, Spain, 20 miles northwest of the city of Oviedo. The harbor, protected by a jetty, has a lighthouse which marks its eastern point. It admits, however, only small craft. The port is engaged largely in fishing, and there are fish-curing establishments and manufactures of linen and chocolate; stock-raising and agriculture also are carried on, and in the vicinity are mines of manganese. Population, in 1900 (commune), 10,160.

CUDRAKA, shoo'drá-ká. The reputed author of the Sanskrit drama *Mricchakatika* (q.v.). See ŚUDRAKA.

CUD'WORTH, RALPH (1617-88). An English theologian and philosopher. He was born at Aller, in Somersetshire, and admitted pensioner of Emmanuel College, Cambridge, in 1632, where he took his degree of M.A. and became an eminent tutor. In 1645 he was appointed master of Clare Hall and regius professor of Hebrew; in 1654 he was chosen master of Christ's College; in 1662 appointed to the rec-

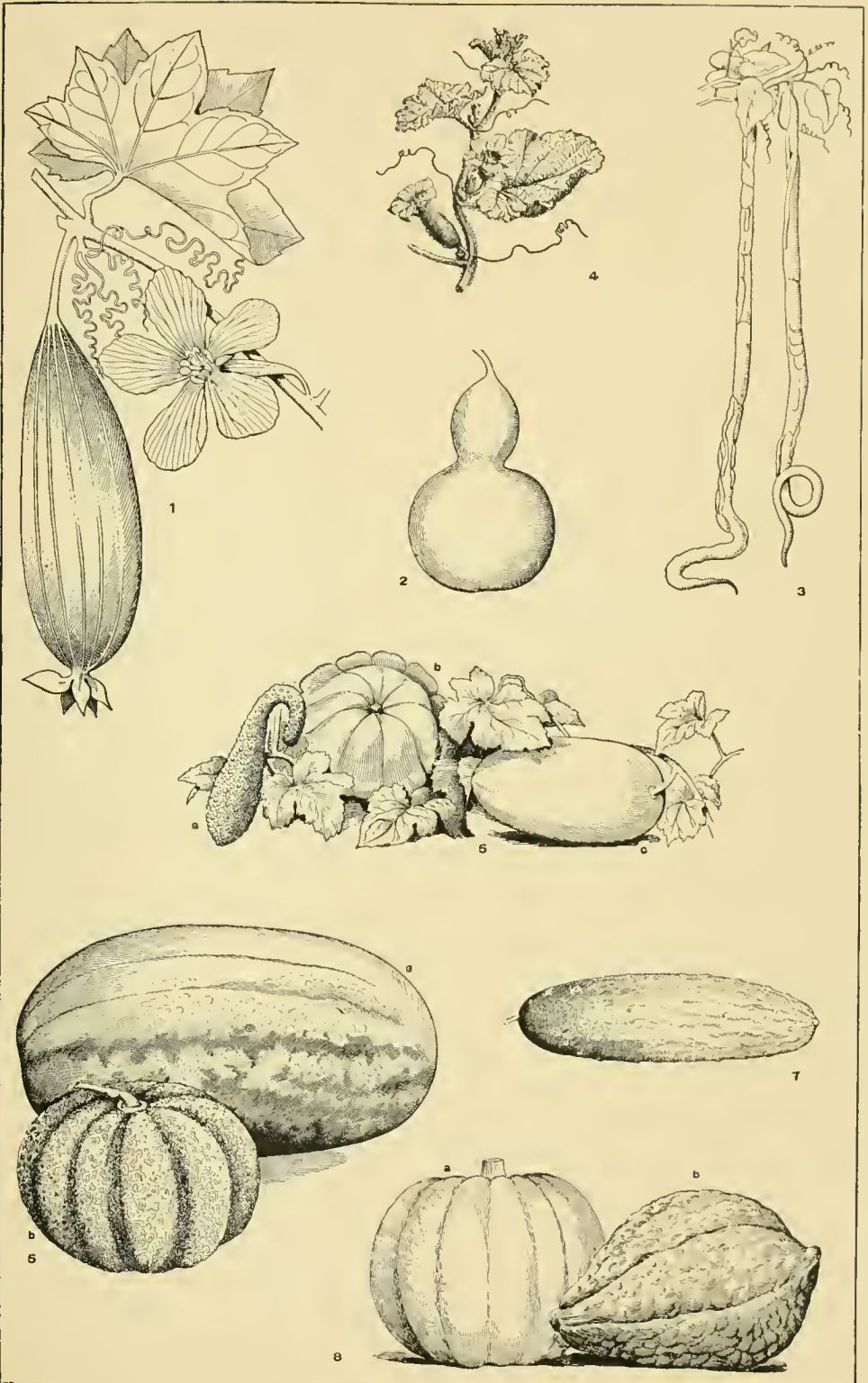
tory of Ashwell; and in 1678 installed prebendary of Gloucester. He died at Christ's College. Cudworth's chief work, entitled *The True Intellectual System of the Universe* (1678), advocates a Platonizing doctrine of philosophy, especially emphasizing the necessity of a teleological view, against the contention of the mechanists of the day, and defending the doctrine of innate ideas. From such views the remarkable group of which he was a leader obtained the name of the Cambridge Platonists (q.v.). A *Treatise Concerning Eternal and Immutable Morality*, which was first published by Dr. Chandler, Bishop of Durham, in 1731, champions the innate character of our moral ideas, which are held to cognize the objective reality of good and evil with the same immediateness and certainty which attends our geometrical knowledge. Consult: Martineau, *Types of Ethical Theory*, vol. ii. (Oxford, 1898); Lowrey, *The Philosophy of Ralph Cudworth* (New York, 1885); and Birch, *Life*, in the edition of Cudworth's works (Oxford and London, 1829).

CUENCA, kwán'ká. The capital of the Province of Azuay, Ecuador, situated on the Rio Matadero, 8640 feet above the level of the sea, 85 miles south-southwest of Quito (Map: Ecuador, B 4). It has straight streets, and contains, among the chief buildings, the cathedral, the high school (formerly a Jesuit college), the prison, and the Government building. It is the centre of a fertile grain, cotton, sugar, and cochineal producing region, and rich metal deposits are worked in the neighborhood. The most important manufactures are pottery, hats, and woolens, and a considerable trade in preserved fruits, cheese, and grain is carried on. Population, about 25,000. Cuenca was founded in 1557, on the site of the old native village Tumbamba, and in 1786 was created an episcopal see. There are numerous interesting Aztec remains in the vicinity. The mountain of Tarqui on the south was chosen in 1742 for determining the meridian line of La Condamine, Bonguer, and Godin. At the base of the mountain occurred the battle of Tarqui in 1828 between the Colombian and Peruvian forces.

CUENCA. A city of Spain, the capital of the province of the same name and the seat of a bishopric, about midway between Valencia and Madrid (Map: Spain, D 2). It is picturesquely situated, at an elevation of about 3000 feet, on the river Júcar, at the confluence of the Huescar, and is poorly built, with narrow, crooked streets. The walls are in ruins, and the city, once celebrated for industry and art, but faintly suggests its former prosperity. A fine bridge spans the Júcar, and there are a college and several notable churches, the most pretentious of which is the Gothic Cathedral, with the Chapel of the Albornoces. The city has some manufacturing interests, and a trade in lumber and wine. Population, in 1901, 10,505.

Cuenca first appears in the history of the ninth century, under Saracen power. In 1177, after a long siege, it fell into Christian hands, though earlier in the century it had been captured, but retaken. It was granted the dignity of a municipality in 1257. The city was taken by the English in 1706 after bombardment, and in 1808 and 1810 was sacked and burned by the French—disasters which contributed materially

CUCUMBER ALLIES



1. LUFFA OR DISHRAG GOURD (*Luffa ægyptiaca*).
2. BOTTLE OR CALABASH GOURD (*Lagenaria vulgaris*).
3. SNAKE GOURD (*Trichosanthes Angulina*).
4. FLOWERS OF MUSK-MELON (*Cucumis melo*).
5. SUMMER SQUASH (*Cucurbita*); *a*, Crookneck; *b*, Custard or Patty-pan; *c*, Vegetable Marrow.

6. *a*, WATERMELON (*Citrullus vulgaris*); *b*, MUSK-MELON (*Cucumis melo*).
7. CUCUMBER (*Cucumis sativus*).
8. *a*, PUMPKIN (*Cucurbita pepo*); *b*, WINTER OR HUBBARD SQUASH (*Cucurbita maxima*).

to its decline. In 1874 Cuenca fell into the power of the Carlists, who ravaged the city, infuriated by its stubborn resistance.

CUERNAVACA, kwār'ná-vá'ká. The capital of the State of Morelos, Mexico, magnificently situated in the valley of the Cuernavaca, 47 miles south of Mexico City, and 5000 feet above sea-level (Map: Mexico, J 8). It contains a church built by Cortés, an agricultural academy, a fine Government building, a theatre (with a capacity for 2000 spectators), a hospital, and a literary institute. The city is the centre of a fertile district, and has extensive sugar-refineries and distilleries. Near by are the ruins of an Aztec temple, 400 feet high, composed of five terraces. Cuernavaca, at the advent of the Spaniards, was an old Indian village, and became, after its capture, the favorite residence of Cortés, his palace being still extant. In 1863 Maximilian made it his residence. It bears many marks of his royal favor, especially in its public gardens. Population, in 1895, 8747.

CUERO, kwār'ró. A town and the county-seat of De Witt County, Tex., 104 miles east by south of San Antonio; on the San Antonio and Aransas Pass and the Southern Pacific railroads (Map: Texas, F 5). It is located in a rich agricultural belt, producing chiefly corn and cotton, and has cotton gins and compresses, a cotton-mill, cottonseed-oil mills, machine-shops, a tannery, broom-factories, etc. Population, in 1890, 2442; in 1900, 3422.

CUERVO, kwār'vó, JOSÉ RUFINO (1844—). A Spanish-American author, born at Bogotá, Colombia. He has made his home in Paris. He became an authority on the Spanish language, on which subject he published: *Apuntaciones críticas sobre la lengua Bogotana* (1872), and a critical edition of the *Gramática Castellana* of Andrés Bello (1890).

CUESTAS, kwá'stás, JUAN LISBOA (1837—). A South American politician and a President of Uruguay, born at Paysandú. In 1879 he became collector of customs, in 1880 Secretary of the Treasury, in 1886 Secretary of State, and in 1891 Senator for Paysandú. He was appointed president of the Senate in 1897; in 1898, after the assassination of President Borda, was placed in charge of the provisional Government; and in 1899 was elected President of the Republic.

CUEVA, kwá'vá, HENRIQUEZ ARIAS DE SAAVEDRA, BALTAZAR DE LA (1626-86). A Spanish statesman. He was born in Madrid, and was a son of the Duke of Albuquerque. He was educated at the University of Salamanca, and successively became Councilor of State, Councilor of the Indies, Ambassador to Germany, and Viceroy of Peru, Tierra Firme, and Chile, in which capacity he introduced many beneficent reforms and greatly improved the condition of the Indians.

CUEVA, JUAN DE LA (1550-1607). A Spanish poet, born in Seville. Of the life of this poet very little is known. He left a quantity of works, in the form of plays, poems, letters, epigrams, romances, and histories. The plays are of the most value, as in them he departed from the classic model, and attempted a more romantic and less artificial type.

CUEVAS DE VERA, kwá'vás dá vā'rá. A town of Spain, in the Province of Almería, 42 miles northeast of Almería (Map: Spain, D 4). It is situated in a plain on the right bank of the Almanzor, near its entrance into the Mediterranean, and is generally well built, with broad and regular streets. It has two spacious plazas, and among the principal edifices are an old Moorish castle and the parish Church of the Incarnation, a handsome Doric structure, dating from 1758. A large number of persons are employed in the silver-mines of the vicinity; agriculture and stock-raising are also important industries. There are some manufactures, principally of pottery. Population, in 1890, 20,341; in 1900, 20,603.

CUFA, koo'fá. A ruined city of Mesopotamia, in the Turkish Vilayet of Bagdad. It was founded by the Arab conquerors of Persia soon after the decisive battle of Cadesia in 636, and speedily became the political and intellectual capital of the early Caliphate. At the height of its prosperity it numbered from 150,000 to 200,000 inhabitants, for the most part of the pure Arab stock of Yemen. The schools of Cufa exercised the very greatest influence on the development of Arabian literature and theology, and its grammarians were the originators of the so-called Cufan script, which occurs frequently in Arabic manuscripts. Internal dissensions and the removal of the capital to Damascus brought about the decline of the city.

CUFFE, WILLIAM ULICK O'CONNOR. See DESART, FOURTH EARL OF.

CUF'FEE, PAUL (1759-1818). An American sea-captain, half Indian, half negro, born near New Bedford, Mass. He was a member of the Society of Friends, and used his wealth, acquired at sea, in the effort to encourage the colonization of his people in Sierra Leone. He carried out thirty-eight colonists on his own ship in 1815, and died while waiting for permission from England to make further settlements in the colony.

CUF'FEY. A name formerly given to negroes in the West Indies, and common among the maroons of Jamaica.

CU'FIC WRITING. See KUFIC WRITING.

CUI, kó'è', CÉSAR ANTONOVITCH (1835—). A Russian composer and military engineer, born at Vilna. He studied at the gymnasium, where his father, a survivor of Napoleon's army of invasion, taught French. After studying music with Moniuszko (q.v.) for some six months at Vilna, he entered the School of Engineering and the Engineering Academy at Saint Petersburg, becoming subsequently professor of fortification in several military academies. Among his pupils have been several grand dukes, the famous Skobelev, and Nicholas II. During the Russo-Turkish War he was sent to examine the fortifications on the Danube. His report, *Four Notes of an Engineering Officer from the Theatre of Military Operations in European Turkey*, was translated into several languages, and attracted considerable attention. Among his text-books the best-known are: *A Short Manual of Field Fortification* (7th ed. 1894), and *A Short Historical Sketch of Permanent Fortification* (1889). His musical studies he continued with Balakireff (q.v.), making his debut with a Scherzo in F major for orchestra (1859).

His opera *The Prisoner of Caucasus* (1857-58) and the comic opera *The Mandarin's Son* were performed privately, and exhibited no departures from established tradition. In 1864 he became musical critic of the *Saint Petersburg Gazette*. He championed the theories of the Young Russian school, attacking the conservative attitude of the critics, rejudging established reputations, subjecting everything to a keen and searching analysis. He received the nickname 'Musical Nihilist,' and his opera *William Ratcliff* (1869), based on Heine's drama, and embodying the new theories of 'melodic recitative,' met with severe criticism. *Angelo* (1876), based on Victor Hugo's drama, carried the theories even further, and met with a similar fate. In 1883 he rewrote *The Prisoner of Caucasus*, adding a new act, and the work had considerable success. *Le Flibustier* (1894), words by Richepin, was successful at the Paris Opéra Comique, and *The Saracen* was favorably received in 1899. His numerous songs, both to Russian and to French words, are veritable gems, while his pieces for solo instruments and for chorus enjoy great vogue. He was never fond of orchestration, and is far behind his Russian colleagues in that line, but the sincerity and passion of his works are unique. Few can equal him in delineating love in all its varied aspects. As a critic, in Russian periodicals and the French *Revue et Gazette Musicale*. Cui enjoys an enviable reputation. His *La Musique en Russie* (Paris, 1880) is the only sketch of Russian music written with authority, even though it is at times marred by the author's æsthetic views. *The Russian Lied* (1896) is a detailed study of all important Russian song-writers, with careful reference to both music and text. Consult: Countess de Mercy-Argenteau, *César Cui* (Paris, 1888); Pongin, *Essai historique sur la musique en Russie* (Turin, 1897).

CUIRASS, kwê-râs' or kwê'- (Fr. *cuirasse*, from ML. *coratium*, breastplate, from Lat. *coriacus*, leathern, from *corium*, leather). Originally a jerkin, or garment of leather for soldiers, so thick and strong as to be pistol-proof, and even musket-proof. The name was afterwards applied to a portion of armor made of metal, consisting of a backplate and a breastplate hooked or buckled together, with a piece joined to the back called a *culet* or *garde de reins*. For illustration, see ARMOR.

CUIRASSIER, kwê-râs-sêr' (Fr., from *cuirasse*, cuirass). In modern armies, the name given to certain soldiers of heavy cavalry. They are survivals of the troopers of the sixteenth and seventeenth centuries, who wore helmet and cuirass. There are four regiments of cuirassiers in the Russian Army, and twelve regiments each in the German and French armies. (For illustration, see Plate of ARMOR.) The Russian cuirass is of iron, coated with copper, and weighs 30 pounds; the German is of white metal with a brass plate, and the French of steel with a brass plate, their respective weights being 13½ and 16 pounds. There are no cuirassiers in the British Army, although the Life Guards and Royal Horse Guards wear dress cuirasses of steel, costing £3 6s. each, which are discarded on active service. In the time of Queen Mary there were heavy horsemen known as cuirassiers, who wore

body armor over buff coats. They carried swords and pistols, and their reins were strengthened with iron chains. The bodyguard of Napoleon III., Les Cent-Gardes, wore aluminum cuirasses. No cuirass is bullet-proof against a direct shot. See CAVALRY, where an historical sketch of mounted troops is given.

CUISSART, kwê-sârt' (OF., from *cuisse*, thigh, from Lat. *coxa*, hip). A variety of ancient armor worn by troopers. Cuissarts consisted of small strips of iron plate laid horizontally over each other round the thigh and riveted together.

CUITLAHUATZIN, kwê-t-lâ-wüt-sên', or **CITLAHUATZIN** (1470-1520). An Aztec prince, younger brother of Montezuma II. When the latter was seized by the Spaniards, Cuitlahuatzin was also for some time in their hands, but was ultimately released. As the acknowledged leader of the Aztecs after the capture of Montezuma, he led the famous attacks upon the army of Cortés. He also directed the operations of the Aztecs during the retreat of the Spaniards to the coast. He was afterwards elected to succeed Montezuma, but died of a pestilence after his installation, and was succeeded by Guatemotzin.

CUJA'CIUS, properly **JACQUES DE CUJAS**, zhâk de ku'zbâ', or **CUJAUS**, ku'zhô' (1522-90). A French jurist of the sixteenth century. After studying law, he was appointed teacher of the law at Cahors (1554), and in the following year, on the recommendation of the Chancellor L'Hôpital, gained the chair of law in the University of Bourges, after which he taught successively at Valence, again at Bourges, at Valence, at Paris, and at Bourges, at which last place he resided from 1577 till his death, October 4, 1590. He was one of the most eminent jurists of his day, and his learning was founded on the most diligent study of original manuscripts of the Roman laws. His treatment of these authorities and of the feudal system was classical and reconstructive, free from scholastic subtleties. He had in his library 500 manuscripts on Roman law, and by his emendations contributed greatly to remove the obscurities of jurisprudence. A complete collection of his works was edited by Fabrot (10 vols.), at Paris (1658), and reprinted at Venice (1758-83), and at Prato (1834-43). Uhl has edited separately Cujacius's *Animadversiones et Observationes*. Consult: Spangenberg, *Cujacius und seine Zeitgenossen* (Leipzig, 1882); Berriat Saint Prix, *Histoire du droit romain; Histoire de Cujas* (1821).

CULÁMAN, koo-lâ'mân. See MANOBO.

CULASI, koo-lî'sê. A town of Panay, Philippines, in the Province of Antique, situated on the western coast, about 52 miles north of San José de Buenavista. Rice, cacao, fruits, and pepper are cultivated. Population, in 1898, 10,553.

CUL'DEES (OIr. *ceilec*, servant of God, from *ceile*, servant + *Dē*, gen. sg. of *Dia*, God). Anchorite monks who came into Scotland from Ireland in the eighth and ninth centuries, and established themselves in many places, but who in the thirteenth century had been absorbed by the regular Orders, particularly that of Saint Augustine. Their monasteries, which, on the Co-

humban model, were really villages, on Saint Serf's Island, Loch Leven, at Saint Andrews, Monymusk, Abernethy, and at Monifeith, near Dundee, are matters of record. Their abbots were often laymen. The mystery about their origin and fate gave rise to the idea that they were particularly holy, and that they retained the primitive Christian faith. So claimed Hector Boece in his Latin history of Scotland (Paris, 1516), as many, especially ardent Presbyterians, have done since. But the facts were established by W. Reeves, *The Culdees of the British Isles* (Dublin, 1864), and F. Kene, *Celtic Scotland* (3 vols., Edinburgh, 1876-80).

CULENBORG. See KULENBURG.

CULEX (Lat., gnat). A short pastoral and mock-heroic poem of 414 hexameter lines, attributed to Vergil. A sleeping goatherd is awakened by the sting of a gnat, and kills the insect, but finds that it has saved his life by rousing him in time to escape from an approaching serpent. The gnat's shade appears to him in the night, and reproaches him for its death; whereupon the goatherd builds a tomb for it and celebrates the usual funeral rites.

CULIACAN, kōō'lyá-kán'. The capital of the State of Sinaloa, Mexico, on the Culiacan River, 50 miles from the Pacific coast (Map: Mexico, E 5). It is situated in a broad valley, and contains several plazas, those of Rosales and La Constitucion being notable, an ancient cathedral, a seminary, and a mint. It is an episcopal see. The city has some manufactures, principally of textiles, and a large tobacco warehouse. Culiacan was founded in 1599, with the name San Miguel. Population, in 1895, 14,205.

CULICIDÆ, kú-lis'i-dē (Neo-Lat. nom. pl., from Lat. *culex*, gnat). A family of tipuloid Diptera, the mosquitoes, having long and slender wings, the veins and body bearing flattened scales. See MOSQUITO.

CULILAWAN BARK. The bark of a moCCA-tree, *Cinnamomum culilawan*, used like cinnamon (q.v.).

CULIN, STEWART (1858—). An American anthropologist, born in Philadelphia, a descendant of Johan van Culin, one of the earliest Swedish settlers on the Delaware. He was educated at a Friends' school, and afterwards at Nazareth Hall. Leaving this school at the age of seventeen, he engaged in business, but soon developed a deep interest in scientific matters, and, through contact with Dr. Daniel G. Brinton, was led to take up original work in anthropology. In 1883 he was elected secretary of the Numismatic and Antiquarian Society of Philadelphia, and began a study of the Chinese in America, resulting in a series of papers on Chinese games. In 1889 he became secretary of the Archaeological Association of the University of Pennsylvania, and a curator in the Museum of Archaeology; and in 1892 he was appointed director of the museum. In this capacity he represented the University of Pennsylvania at the Columbian Historical Exposition in Madrid, where he was at the same time secretary of the United States Commission. In 1888 he organized the Oriental Club in Philadelphia, of which he became secretary; in 1890 he was elected a fellow in the American Association for the Advancement of Science. He was president of the American Folklore Society in 1897, and was elected to the vice-presidency of

anthropology in the American Association in 1901. In addition to many minor publications, he is author of: *Chess and Playing Cards* (1896); *Korean Games* (1896); and an elaborate memoir on "Games of the American Aborigines," incorporated in the *Twenty-third Report of the Bureau of American Ethnology*.

CULLEN, PAUL (1803-78). An Irish prelate. He was educated in Rome, where he became rector of the Irish College, and in 1848 of the Propaganda College. During the Revolution of that year he saved the college property by appealing to the American Minister. He became Archbishop of Armagh and Primate of Ireland in 1849, and Archbishop of Dublin in 1852. He was a man of great executive ability, piety, and zeal in the restoration and erection of churches, reformatories, and hospitals. He assisted O'Connell, opposed the Fenians, forbade the clergy to take active part in politics, and advocated at the Vatican Council the definition of Papal infallibility. He was the main supporter of the Catholic University at Dublin, and in 1866 was made a cardinal, being the first Irishman to receive that dignity since the Reformation.

CULLEN, WILLIAM (1710-90). A Scotch physician, one of the most celebrated professors of medicine in the universities of Edinburgh and Glasgow. He was born at Hamilton, Scotland, his father being factor to the Duke of Hamilton. He acquired his medical education between 1727 and 1736, under great difficulties, but fortunately secured the aid of John Paisley, a surgeon apothecary, and Monro the Elder. In 1736 he began to practice his profession in his native town, and was rapidly successful. One of his pupils was William Hunter (q.v.). In 1740 he received the degree of M.D. from Glasgow University. In 1744 he removed to Glasgow; in 1746 he began to lecture on the theory and practice of physic, on botany and the materia medica, and finally on chemistry, in Glasgow University. In botany Cullen seems to have lectured in Latin, but in the other departments he adopted the English language as the vehicle of expression, an innovation of great importance, which permitted him to adopt a more familiar style of lecturing than had hitherto been in use. One of his original hearers records that "in the physic class Dr. Cullen never read lectures, but only used notes; in the chemistry he sometimes read, but very seldom." In 1757 he became full professor of chemistry, while continuing to teach clinical medicine in the Royal Infirmary, a duty up to this period performed by Dr. Rutherford only, the professor of medicine and botany. In 1760 he undertook also the lectures on materia medica. In 1766 Cullen was placed in the chair of institutes of medicine, vacant by the death of Dr. Whytt; and Black, the greatest chemical discoverer of the time, took Cullen's place as professor of chemistry. In 1773 Cullen was transferred to the chair of the practice of physic.

His most important works are the *First Lines of the Practice of Physic* (1777), in which he sets forth his system of nosology founded on his theories of nerve influence, and which was translated into many languages; *Synopsis Nosologia Methodica* (1785); *Institutions of Medicine* (1787); *A Treatise of the Materia Medica* (1789). His writings have been collected in two volumes by Dr. John Thomson (Edinburgh,

1827), by whom also a life was commenced, the first volume of which was published in 1832. This biography was continued by his son, and finally completed in a second volume by Dr. Craige in 1859.

CULLERA, *kōō-lyā'rá*. A fortified town of Spain, in the Province of Valencia, on the Júcar River, near its entrance into the Mediterranean, 23 miles south-southeast of Valencia (Map: Spain, E 3). Its streets are irregular but level, and among the noteworthy features are a ruined castle and the chapel of the Virgen de Cullera. Fishing, agriculture, and stock-raising are the principal industries. The city is the centre of a considerable trade in grain, rice, oranges, wine, etc. Cullera was of great military importance under the Moors, by whom it was strongly fortified, and successfully withstood attacks of the Christian armies in 1234 and 1235, though later it was taken by James I. of Aragon. Population, in 1900, 11,957.

CULLODEN, or DRUMMOSSIE MOOR. A Scottish battlefield in Inverness-shire, near the Moray Firth. The place was formerly a desolate tableland, but is now well cultivated. Here on April 16 (new style, 27), 1746, the Duke of Cumberland, with 12,000 royal troops, overwhelmed an army of 5000 Highlanders, under Prince Charles Edward, the Young Pretender, and extinguished the hopes of the House of Stuart of regaining the English crown. A monumental cairn marks the spot where the battle was fiercest, and where many of the slain lie buried. At Culloden House, a mile to the north, the family seat of Duncan Forbes, the valuable historical collection of *Culloden Papers*, covering the years 1625-1748, was discovered in 1812. They were published in London in 1815. Consult William Augustus, Duke of Cumberland, *Authentic Account of the Battle of Culloden* (London, 1746).

CUL'LOM, SHELBY MOORE (1829—). An American politician, born in Wayne County, Ky. He was admitted to the bar in 1855, and began the practice of the law at Springfield, Ill. Here he soon became prominent in politics, was several times elected to the Illinois Legislature, and was Speaker of the House in 1861 and again in 1873. He was a member of Congress for three terms after 1865, and was Governor of Illinois from 1876 to 1883. He then entered the United States Senate as a Republican, and was reelected in 1889, 1895, and 1901. He was the author of the Interstate Commerce Law, and for many years was chairman of the Senate Committee on Interstate Commerce. In 1898 he was appointed one of the commissioners to establish the Government of Hawaii.

CULLUM, GEORGE WASHINGTON (1809-92). An American soldier and writer. He was born in New York, graduated in 1833 at West Point, and was instructor of engineering there from 1848 to 1855. He was made chief engineer of the Department of the Missouri in 1861, superintended engineering works on the Western rivers, and was chief engineer at the siege of Corinth. He was superintendent of the Military Academy from 1864 to 1866, and was brevetted major-general in 1865. He retired from active service in 1874. He published: *Systems of Military Bridges* (1863); *Biographical Register of the Officers and Graduates of the United States Military*

Academy (1868; 3-vol. ed. 1890); *Campaigns and Engineers of the War of 1812-15* (1879). On his death he left part of his fortune to be used for the erection of the Memorial Hall at West Point, and for the continuance of his *Biographical Register*.

CULM. See KULM.

CULM (ME. *culme*, *colm*, soot, smoke, or perhaps connected with Welsh *culm*, knot, the coal being found in knots in some places in Wales, OIr. *colmmene*, nerve, Bret. *koulm*, knot). A term used in the United States for the waste coal thrown out in anthracite mining. Owing to its fine size, much difficulty was experienced for some time in using it. At the present day it is either pressed into bricks or burned on special types of grate, often with forced draught. The name has a similar application in parts of Wales, but in some parts of England it is used in a general sense for anthracite. See ANTHRACITE.

CULMANN, *kōō'män*, KARL (1821-81). A German engineer, born at Bergzabern, Bavaria. He studied at the Artillery School of Metz and the Technical School of Karlsruhe, and from 1841 to 1849 was active as an engineer in bridge construction. In 1855 he was appointed professor of engineering in the Polytechnic School of Zurich, of which he was director from 1872 to 1875. He was the originator of the method of graphical statics, by which the strength of structures is investigated through diagrams made to scale. In exposition of this he published *Graphische Statik* (1864-66). Among his further works is *Untersuchungen über die Schweizer Wildbäche von 1858 bis 1863* (1864), translated into Italian and French.

CULMBACH, *kōōlm'bäk*, HANS VON. See KULMBACH, HANS VON.

CULMINATION (from ML. *culminare*, to culminate, from Lat. *culmen*, OLat. *columnen*, height, from *collis*, hill, *celsum*, high). An astronomical term, signifying the passage of a star across the meridian. The star is then at the highest point (*culmen*) of its course; hence the name. The sun culminates at midday, or 12 o'clock, apparent solar time—which seldom agrees exactly with mean time as shown by a watch or clock. The full moon culminates at midnight. The time of culmination of a fixed star is always exactly midway between the times of its rising and setting; in the case of the sun, moon, and planets, it is only approximately so.

CUL'PA. At Roman law, *culpa* sometimes means fault in general, but in the narrower and usual sense it designates carelessness or negligence. When damage has been done without right and willfully (*dolo*), the doer is always responsible. When damage is occasioned by a careless act or by failure to act as a careful person would act, the person chargeable with carelessness is not usually responsible unless he be under some special obligation to exercise care (*diligentia*). Such an obligation regularly exists only in contractual and quasi-contractual relations; and here the question what degree of carelessness creates liability depends upon the degree of care which the law requires. The standard, in most cases, is the care commonly exercised in similar matters by a good householder (*diligentia boni patris familie*). Exceptionally, in some cases, a person who is habitually some-

what careless is held to that degree of care only which he is accustomed to exercise in his own affairs (*diligentia quam in suis*). This is true when the advantage of the contractual relation is wholly on the other side, as in the deposit for safe-keeping without remuneration, and also when the other party is chargeable with negligence if he enters into relations with a careless person, as in partnership. By reason, however, of the fiduciary character of these relations, the careless depositary or partner who has failed to exercise even that degree of care which he is wont to exercise in his own affairs is regarded as guilty of willful wrong (*dolus*). In contractual relations very gross carelessness (*culpa lata*) is also treated as willful wrong. Whether this is true outside of contractual relations—whether very gross carelessness begets an action on tort—is disputed. Regularly, of course, at Roman law as at English law, action on tort lies only when willful intent can be shown or presumed. Exceptionally, however, and by statutory rule (*lex Aquilia*), the person who has damaged another's property by a careless act is liable although no contractual relation exists between the parties.

At modern civil law most of the Roman rules still obtain. Modern legislators, however, have generally discarded the exceptional standard of the *diligentia quam in suis*; and the French civil code (art. 1383) and some of the codes based on the French, e.g. the Spanish civil code (art. 1089), lay down the broad rule that every person of sound mind who has reached the age of discretion is responsible for damage occasioned by his negligence, whether of act or of omission; but these provisions have not been interpreted as creating a general duty to act in the interest of strangers. For the English and American applications of the civil law doctrine, see BAILMENT; NEGLIGENCE. Consult the authorities referred to under CIVIL LAW.

CULPEPER, JOHN. An early English emigrant to the Carolinas, leader of the 'Culpeper Insurrection.' In 1678 he led a successful insurrection in the northern or Albemarle Colony of Carolina against the representatives of the proprietaries, who had interfered arbitrarily in elections and had imposed excessive taxes. He and his followers succeeded in gaining control of the Government, but when he went to London to arrange a compromise with the home authorities he was promptly arrested on a charge of treason. He was finally acquitted, however, on the ground that there had really been no authorized Government in the colony at that time to rebel against. In 1680 Culpeper laid out on paper the plan of the city of Charleston.

CULPEPER, or COLPEPER, THOMAS (?-1749). A grantee (1673) and Colonial Governor of Virginia. He was appointed Governor for life in 1675, but did not come to the Colony until 1680. In 1683, having administered the office chiefly for his own gain, being shrewd and unscrupulous to the last degree, he returned to England in spite of his orders, was tried and convicted of corruption, and was deprived of his commission. His daughter Catherine brought his great possessions in dower to Baron Fairfax and his descendants.

CULPER. A local name in Africa for a fish resembling a perch, but of uncertain position,

ichthyologically, which inhabits the Zambezi Valley. It burrows in the mud, and thus survives droughts, and is exhumed both by animals and the native negroes for food, but is not thought palatable by the white colonists.

CULPRIT FAY, THE. The title of a poem by Joseph Rodman Drake (1816). Its subject is the love of a fairy for a mortal maiden, and his expiation of the offense.

CULTIVATION. See TILLAGE.

CULTIVATOR (Fr. *cultivateur*, from ML. *cultivare*, to cultivate, from Lat. *cultura*, cultivation, from *colere*, to till). An agricultural implement extensively manufactured and used in the United States. The common name for it in Great Britain is grubber. Certain forms are called scarifiers. It is used for a number of purposes, such as preparing soil for planting, loosening soil between rows of plants, destroying weeds, etc. There are many forms, but usually the essential feature is a triangular or rectangular iron frame in which are fixed tines or teeth, somewhat like those of a harrow, but curved, and so placed as to enter the ground obliquely when the implement moves forward. Handles like those of a plow are provided for control of the implement and the centre beam of the iron framework projects in front for the attachment of wheels and draught-elevises. In some forms the implement is mounted on wheels and provided with a seat for the operator and various levers for the control of the implement. These are called *rider* cultivators, while the simpler forms are known as *walker* cultivators. The two forms are sometimes combined. See also IMPLEMENTS, AGRICULTURAL; TILLAGE.

CULTURE (Lat. *cultura*, cultivation). Specifically, in anthropology, the aggregate result of human development (physical and pschical) either in general or up to and at any particular stage. The chief phases of culture are coördinated with the principal stages of development, themselves usually expounded in terms of social organization, i.e. savagery, barbarism, civilization, and enlightenment. The interchange of culture is one of the most effective factors in human progress. See MAN, SCIENCE OF; AGRICULTURE.

CULTURKAMPF, kool-toor'kämpf. See KULTURKAMPF.

CULTUS COD. A marine fish (*Ophiodon elongatus*) of the family Chiridae, abundant from Lower California to Alaska, and one of the most important food-fishes of the Pacific Coast, where it is also known as ling, buffalo-cod, and blue-cod. *Cultus*, in the Chinook jargon, means 'common,' or 'ordinary,' and was applied to distinguish this species from the true cod of that coast. It is cod-like in form, dark-brown above, variously spotted, and bluish-green below, the flesh being also bluish; and reaches a length of 5 feet and a weight of 30 to 40 pounds, but much smaller specimens are usually brought to market. It lives about rocky places, sometimes in considerable depths, and spawns in summer; and it feeds upon fishes and crustacea and is excessively voracious, often being taken by seizing a fish upon the angler's hook. Its flesh is regarded as of superior quality.

CULVERIN (Fr. *coulcuvrine*, ML. *colubrina*, culverine, from Lat. *coluber*, serpent). An early form of cannon. See **ARTILLERY**.

CULVER'S PHYSIC, CULVER'S ROOT. See **LEPTANDRA**.

CULVERT (probably from Fr. *couloure*, drain, from *couler*, to flow, from Lat. *colare*, to filter, from *colum*, sieve; influenced in termination by analogy with *covert*). An artificial channel for carrying a small stream underneath a canal or the embankment of a roadway or railway. For very small streams vitrified clay pipe or cast-iron pipe is used for culverts. For streams of larger size box culverts are employed, consisting of two parallel masonry walls covered over with stone flagging and having a paved bottom. Where stone is scarce box culverts are sometimes built of timber, and sometimes, instead of stone flagging, a roof of iron beams imbedded in a concrete slab is employed. Large culverts are usually built with parallel masonry side-walls, supporting a stone or brick roof-arch. A culvert, besides the passageway for the water, has wing walls at one or both ends to hold the embankment in place and protect it from the rush of the flowing water in times of freshet. A full technical description of culvert construction is given in Baker, *Treatise on Masonry Construction* (New York, 1900).

CUMA'CEA. See **CRUSTACEA**.

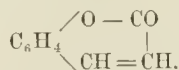
CUMÆ (Lat., from Gk. *Κύμη, Κύμη*). An ancient city on the coast of Campania, founded conjointly by colonists from Chaleis and Cymæ in Eubœa. According to Strabo, it was the earliest of all Greek settlements in either Italy or Sicily, and it is probable that it was founded before the middle of the eighth century B.C., about the same time as the first colonies in Sicily. It soon attained to wealth and power, built several harbors or port towns of its own, including Dicæarchia (Pozzoli) and Neapolis (Naples), and carried on an extensive trade with the interior. From the Chalcidian alphabet of Cumæ the Etruscan and Italian alphabets seem to have been derived. Its prosperity led to wars with the Etruscans and other Italian tribes, and in B.C. 524 a great land army was routed by the Cumæans, while in B.C. 474, when Cumæ was allied with Hiero of Syracuse, the sea-power of the Etruscans was broken in a naval battle near the city. The victory seems to have left Cumæ dependent upon Syracuse, for its power now rapidly waned, and in B.C. 421 it was captured by the Samnites and became an Oscan community. In B.C. 334, along with Capua, it passed under the control of the Romans, and from this period steadily adhered to the fortunes of Rome. In the Second Punic War Hannibal tried to capture it, but was repulsed by Sempronius Gracchus. Toward the close of the Republic it became the municipal capital of the district in which the Roman nobles had their villas and seacoast residences. It continued to exist as a 'quiet' place down to the close of the Roman Empire, but reassumed a momentary importance during the wars of Belisarius and Narses. Its strong fortress, garrisoned by the Goths, was the last place in Italy that held out against the Byzantine Army. The town was finally destroyed, as an abode of pirates, by the Neapolitans in A.D. 1205. Of the ancient fortifications considerable remains may still be

traced, and both on the Acropolis and in the lower city there are fragments of architecture and scanty ruins. Underneath the Acropolis are a number of grottoes and subterranean passages of unknown origin and purpose. One of these caverns was the seat of the oracle of the Cumæan Sibyl (q.v.). Consult Beloch, *Campanien im Alterthum* (Breslau, 1890).

CUMÆAN SIBYL. The most famous of the ancient sibyls. She lived at Cumæ in the crypts under the Temple of Apollo, and has been represented pictorially by several of the great masters. The most noted examples are paintings by Michelangelo in the Sistine Chapel, and by Raphael in the Church of Santa Maria della Pace, in Rome.

CUMANÁ, koo-má-ná'. A town in the State of Bermudez, Venezuela, situated on the Manzanares River, near its mouth, on the Gulf of Cariaco (Map: Venezuela, E 1). It has a college and is the seat of a United States consular agent. The town is an important commercial centre, its trade being promoted by an excellent roadstead and harbor, which are dominated by the fort of San Antonio on a hill overlooking the town. It exports cacao, sugar, cocoanuts, tobacco, pearls, and hides. Population, about 12,000; the suburbs of San Francisco, Guayquerias, and Serritos have an aggregate population which equals that of the mother town. Cumaná, possibly the oldest city in America, was founded in 1520 under the name of Nueva Toledo, and became in the following year capital of the newly erected Province of Nueva Andalucía. It has suffered considerably from earthquakes, notably in 1766 and 1853.

CUMARIN, or COUMARIN (from *cumarou*, the Gallicized form of the native name of the Tonka bean),



The anhydride of cumarin (ortho-oxy-cinnamic) acid. It is a colorless, crystalline substance melting at 67° C. and boiling at 201° C. It has an exceedingly agreeable odor. It is found in various plants, including the Tonka bean (the seeds of the *Dipteryx odorata* and *oppositifolia* Willd.); the woodruff (*Asperula odorata* L.); the melilot (*Melilotus officinalis* Desv.); a number of grasses, such as the sweet-scented vernal grass (*Anthoxanthum odoratum* L.); the fennel or faham leaves (*Angreum fragrans*), much prized among Asiatics for their vanilla-like scent; the Indian sarsaparilla (the root of *Hemidesmus Indicus*), etc. Cumarin is soluble in hot water and in alcohol and ether. It may be obtained from Tonka beans by extracting with alcohol. It has also been prepared synthetically by heating salicylic aldehyde with sodium acetate and acetic anhydride. Tonka beans are largely used to impart the odor of cumarin to snuff. Cumarin is also employed in perfumery and in preparing the beverage well known in Germany as *Maitrank* (May drink), which is made by adding a small quantity of pure cumarin to wine.

CUMBERLAND. A peninsula of Baffin Land, forming the western coast of Davis Strait (Map: Canada, S 3). It cuts off the gulf known as Cumberland Sound.

CUMBERLAND (AS. *Cumbria*). The extreme northwest county of England (Map: England, D 2). It has 75 miles of coast, and an area of 1516 square miles. Two-thirds of the county is cultivated, the rest is covered by mountain and lake. The highest peaks of the Cumbrian Mountains (q.v.) are in this county. The chief rivers are the Eden and Derwent. Mineral wealth abounds, chiefly coal, iron, and lead. Dairy farming and domestic manufactures are carried on. The chief towns are Carlisle, the capital, Cockermouth, Whitehaven, and Wigton. Population, in 1891, 266,550; in 1901, 267,900. Consult: Ferguson, *History of Cumberland* (London, 1890); Wilson (editor), *The Victoria History of Cumberland* (Westminster, 1901).

CUMBERLAND. A city and county-seat of Allegany County, Md., 152 miles northwest of Washington, D. C., and 150 miles southeast of Pittsburg, Pa., on the Chesapeake and Ohio Canal and on the Pennsylvania, the Baltimore and Ohio, and other railroads (Map: Maryland, B 2). It is in a remarkably picturesque locality on the Potomac River, some 600 or 700 feet above tide, on the outer edge of the Cumberland Canal coal region, and ships vast quantities of semibituminous coal. There are also extensive rolling-mills for the manufacture of railroad materials, iron-foundries, steel-works, railroad shops, tanneries, brick-works, flour-mills, glass-works, and cement-works. Cumberland was laid out in 1785 on the site of Fort Cumberland, which was erected in the winter of 1754-55 at the outbreak of the French and Indian War. The town was incorporated in 1815, becoming a city in 1850. The government is administered by a mayor, elected every two years, and a city council, some of the members of which are elected by wards and some at large. The several administrative boards are nominated by the executive subject to the approval of the council. Ownership and operation of the water-works and electric-light works are municipal functions. Population, in 1890, 12,729; in 1900, 17,128. Consult Lowdermilk, *History of Cumberland* (Washington, 1878).

CUMBERLAND. A town in Providence County, R. I., six miles north of Providence, on the Blackstone River, and on the New York, New Haven and Hartford Railroad. It has extensive manufactures of horseshoes, cotton, etc. Cumberland was incorporated in 1747. The government is administered by annual town meetings. Population, in 1890, 8090; in 1900, 8925.

CUMBERLAND, THE. A Federal war-vessel under the command of Lieut. George U. Morris, sunk by the Confederate ram *Merrimac* in Hampton Roads, March 8, 1862. She went down firing and with colors flying, and carried with her a hundred of her crew.

CUMBERLAND, DUKE OF. See WILLIAM AUGUSTUS, Duke of Cumberland, and ERNST AUGUST, King of Hanover.

CUMBERLAND, RICHARD (1632-1718). An English moralist. He was born in London, educated at Saint Paul's School and at Cambridge, appointed in 1658 to the rectory of Brampton, Northamptonshire, and in 1667 to the living of All Hallows, Stamford. In 1691 he was made Bishop of Peterborough. His work, *De Legibus Naturæ Disquisitio Philosophica* (1672), translated into English by Jean Maxwell in 1727, was

one of the first protests against the egoism of Hobbes's ethics. He maintained therein that "the common good of all is the chief end and ultimate standard of morality, and is thus one of the forerunners of the well-known English Utilitarians. Consult: Spaulding, *Richard Cumberland als Begründer der Englischen Ethik* (Leipzig, 1894); and Albee, "The Ethical System of Richard Cumberland," in the *Philosophical Review* (Boston, 1895).

CUMBERLAND, RICHARD (1732-1811). An English dramatic writer and essayist, born in Cambridge. He was the great-grandson of the Bishop of Peterborough, and was the grandson, on his mother's side, of Dr. Richard Bentley. He graduated at Trinity College, Cambridge, in 1750, and two years afterwards was elected fellow. Having been appointed private secretary of the Earl of Halifax, he gave up his intention of entering the Church, and became Ulster secretary during Halifax's term as Lord Lieutenant of Ireland. Later he obtained a sinecure in the Board of Trade, and retired to Tunbridge Wells, where he devoted himself to literature, and wrote farces, tragedies, comedies, pamphlets, essays, novels, and translations from the Greek poets. Many of his comedies were well received, but have not survived. They include *The Brothers* (1769) and *West Indian* (1770), his best play. Goldsmith describes Cumberland with gentle satire in *The Retaliation*, as "The Terence of England, the mender of hearts." His *Memoirs* appeared in 1807, but are considered untrustworthy.

CUMBERLAND AND TEVIOTDALE, tē'vī-ot-dāl. DUKE OF. English titles borne by the first cousin of Queen Victoria, George V. of Hanover (q.v.), and perpetuated by his eldest son, Prince Ernest Augustus, born September 21, 1845.

CUMBERLAND GAP. A pass through the Cumberland Mountains on the State line between Kentucky and Tennessee at the southwestern end of Virginia (Map: Kentucky, H 4). It is a notch about 500 feet deep and in some places so narrow as merely to allow room for a roadway. The road between Virginia and Kentucky laid out by Daniel Boone in 1769 passed through Cumberland Gap, and over this road journeyed most of the early emigrants to Kentucky. During the Civil War the Gap was of great strategic importance, constituting as it did a kind of passageway between central Kentucky and eastern and central Tennessee. It was occupied by the Confederate General Zollicoffer, on November 13, 1861, but on June 17, 1862, the Confederates withdrew on the approach of a superior Federal force under Gen. G. W. Morgan, who took possession on the following day and immediately began to strengthen the fortifications. Various minor skirmishes occurred in the vicinity, in the most important of which, that of August 7, the Confederates lost 125 men in killed and wounded, the Federals 68 in killed, wounded, and missing. On the night of September 17 Morgan secretly evacuated the place, destroyed the fortifications and the war material, and by a skillful retreat saved his command from capture at the hands of the superior Confederate forces in the vicinity. On October 22d General Bragg occupied the Gap. On September 8, 1863, the place again passed into the hands of the Federals un-

der General Shackelford, the Confederate General Frazer surrendering, without resistance, 2000 men and 14 pieces of artillery; and here on April 28, 1865, 900 Confederates surrendered and were paroled.

CUMBERLAND MOUNTAINS. A part of the westernmost division of the Appalachian system extending from northeastern Alabama across Tennessee, thence along the boundary of Virginia and Kentucky to near the southern border of West Virginia (Map: Virginia, A 5). Toward the north the range of elevations is continued by the Alleghany Mountains through West Virginia into Pennsylvania. The Cumberland Mountains comprise several parallel ridges, which together form a plateau some 50 miles in width with an elevation ranging from less than 1000 to more than 2000 feet. Their eastern edge is usually defined by a strong escarpment, while on the west the slope is abrupt in Tennessee but less so in Kentucky. The range is composed of Paleozoic strata, including sandstones, limestones, and slates, which inclose valuable deposits of coal and iron. They are usually well timbered with ash, hickory, chestnut, and other hard woods, but the soil is not sufficiently fertile to support a large agricultural population. The slopes of the Cumberland Mountains are drained mostly into the Ohio River by the Cumberland and the Tennessee, the latter river crossing the southern portion of the range after flowing along the greater part of its eastern edge.

CUMBERLAND PRESBYTERIAN CHURCH. See PRESBYTERIANISM.

CUMBERLAND RIVER. A river of Kentucky and Tennessee, rising in the Cumberland Mountains. It flows southwest and west through southern Kentucky and enters Tennessee in longitude 85° 30' W. (Map: Kentucky, C 4). It runs in a semicircle through the northern part of Tennessee and then turning northward reenters Kentucky, running through the southwestern part of the State parallel with the Tennessee River. It joins the Ohio River at Smithland. The total length of the river is over 600 miles. It is navigable for steamboats to Nashville, and for smaller craft for 100 miles above that town.

CUMBERLAND ROAD, THE. A road 800 miles long, which extended from Fort Cumberland, Md., to Vandalia, Ill., and which had an important part in opening up the West and Southwest to settlement from the East. It was begun about 1806, was constructed in sections, and was finished about 1840. It was to have been built by the Federal Government out of funds derived from sales of public lands in the States to be traversed; but additional appropriations soon became necessary, and, largely owing to the influence of Henry Clay, the National Government advanced the sum of \$6,821,246 for this purpose between 1806 and 1838. For many years the road was under Federal control, and was called the 'Great National Pike,' but by 1856 the Government had turned over to the various States through which it passed the portions included within each. For many years it was perhaps the chief avenue for Western emigration, and thousands of prospective settlers passed over it from the various Eastern States. Consult: Hulbert, *The Cumberland Road* (Cleveland, 1903); Sparks, *The Expansion of the American People* (Chicago, 1901); and an

article "The Old National Pike," in vol. lix. of *Harper's Monthly Magazine* (New York, 1879).

CUMBERLAND UNIVERSITY. An educational institution under the supervision of the Cumberland Presbyterian Church, established in 1844 at Lebanon, Tenn. Connected with the university is the theological seminary of the Church, established in 1852. The university also maintains a law department and preparatory department. Its student enrollment in 1901 was approximately 200.

CUM'BRIA (Lat., the land of the Cymry, or Welsh). An ancient British principality, including Cumberland in England, and most of Scotland as far north as the Clyde. In Scotland, however, the boundaries were indefinite, and depended upon the strength of the ruler. Cumbria had a mixed population of Britons, Goidels, and Piets, who, on account of common danger from the Saxons, united and took the name of Cymry. During the sixth century Cumbria ceased to be governed by one ruler, and was united only in times of war. The country, however, was hilly and easily defended. Edmund conquered Cumbria in 946, with the help of the King of South Wales, and gave it to Malcolm of Scotland. William II, of England annexed Cumbria early in his reign. In 1107 David I, of Scotland became Prince of Cumbria, holding it from the English Crown.

CUMBRIAN MOUNTAINS. A group of mountains, 37 by 35 miles in length and breadth, in the northwest of England, occupying part of Cumberland, Westmoreland, and Lancashire. This tract, embracing the English lake district, is of great picturesqueness and beauty, and much frequented by tourists. There are 25 mountain-tops upward of 1500 feet high, including Sea Fell Pike (3210 feet), Sea Fell (3162), Helvellyn (3118), and Skiddaw (3054). The deep valleys between the mountains contain 14 lakes, 1 to 10 miles long. The largest of the lakes are Windermere, Ullswater, Coniston Water, Bassenthwaite Water, and Derwentwater. Many eminent persons have resided among the lakes, the beauty of which has inspired some of the finest writings of Wordsworth, Coleridge, Southey, Professor Wilson ('Christopher North'), De Quincey, Arnold, and Harriet Martineau.

CUM'MING, ALFRED (c.1802-73). An American official. In 1857 he was appointed by President Buchanan Governor of the Territory of Utah, whither he was sent with a protective force of 2500, under the command of Gen. A. S. Johnston, later famous in the Confederate service. He issued, on November 27, a proclamation which declared the Territory to be in a state of rebellion, a copy of which was forwarded to Salt Lake City. Brigham Young, the Mormon president, retaliated by announcing that the region was under martial law, and forbidding the expedition to enter. A compromise was subsequently effected, and Governor Cumming assumed office on April 12, 1858. The troops were retained at Camp Floyd until February 29, 1860. In 1861 Cumming was succeeded by Stephen S. Harding.

CUMMING, JOHN (1807-81). A Scotch preacher and author, born in Aberdeenshire. He was educated at King's College, Aberdeen, and in 1833 was ordained to the Scotch Church, Crown Court, Covent Garden, London, where he

officialied till 1879. He was very popular as a preacher and lecturer, but is remembered chiefly for his controversies with the Roman Catholic dignitaries, and for his interpretation of the apocalyptic writings. The most important of his voluminous publications are: *Apocalyptic Sketches* (1849); *The Great Tribulation* (1859); *Destiny of the Nations* (1864); and *The Seventh Vial* (1870).

CUMMINGS, Amos J. (1841-1902). An American editor and politician, born at Conkling, Broome County, N. Y. A journeyman printer at fifteen, he set type in nearly every State of the Union. He was with William Walker, in the last 'invasion' of Nicaragua (1857), and during the Civil War served as sergeant-major of the Twenty-sixth New Jersey Infantry, and received the Congressional medal of honor for gallantry. Subsequently he became editor of the New York *Weekly Tribune*, and in 1869 joined the staff of the *Sun*, of whose weekly and evening editions he was afterwards editor. From 1887 he was a Democratic member of Congress from New York, and in 1892 and 1896 was a delegate to the Democratic national conventions. During his Congressional career he held many important positions on committees. He was the author of a series of letters written from Florida and California to the *Sun*, over the signature 'Ziska.'

CUMMINGS, JOSEPH (1817-90). An American educator, born in Falmouth, Maine. He was president of Wesleyan University, Middle town, Conn., from 1857 to 1875, and was professor of mental philosophy and political economy there from 1875 to 1877, and was president of Northwestern University from 1881 until his death.

CUMMINGS, THOMAS SEIR (1804-94). An American painter and author, born in England. He came to New York early in life, and studied there with Henry Inman. He painted miniatures in water-color, and many of his sitters were well-known contemporaries of the artist. In 1826 he helped to found the National Academy of Design, and was its treasurer for forty years. He also wrote an account of its history, entitled, *Historic Annals of the National Academy from its Foundation to 1865*. His later life was spent in Connecticut, and Hackensack, N. J., where he died.

CUMMINS, GEORGE DAVID (1822-76). An American clergyman. He was born in Delaware, graduated at Dickinson College, and entered the Methodist ministry. In 1845 he took orders in the Episcopal Church, and was rector of several Episcopal churches in Virginia, Washington, and Chicago. He was chosen Assistant Bishop of Kentucky in 1866, but in 1872 resigned this office, withdrew from the denomination, and founded the Reformed Episcopal Church, of which in 1873 he was made bishop. Consult the *Memoir* by his wife (New York, 1878).

CUMMINS, MARIA SUSANNA (1827-66). An American novelist, born at Salem, Mass. After receiving a good education she began writing for contemporary magazines. In 1854 she scored an immense success with her story *The Lamplighter*—more than 100,000 copies in all being sold; a surprising sale for ante-bellum fiction. Her later books are negligible, and her reputa-

tion has not been maintained, although *The Lamplighter* is still read.

CUM'NOR HALL. (1) An old manor house, near Oxford, of which only a few ruins remain—the place where Amy Robsart was imprisoned, as mentioned in Scott's *Kenilworth*.—(2) A ballad of that name by W. J. Meikle, supposed to have suggested to Scott the idea of *Kenilworth*.

CUMULATIVE SENTENCE. See SENTENCE.

CUMULATIVE VOTING. A method of voting at elections for office and in representative assemblies, intended to obviate the inconveniences of the majority system by giving proportional weight to the minority vote. As commonly practiced, each voter is permitted to cast as many votes as there are candidates for a given office, and he may distribute his votes or give them all to one candidate, as he may choose. It has been advocated for many years, both in England and the United States, as an important measure of electoral reform, but has made headway slowly. The system has been employed to some extent in Illinois and Michigan, and in Parliamentary elections in England. Its constitutionality was established by a decision of the Supreme Court of Michigan in 1891. See ELECTION; ELECTORAL REFORM.

CUMULUS. See CLOUD; CLOUDINESS.

CUNA, kōō'ná. A tribe, apparently of distinct stock, occupying the Isthmus of Panama, in Colombia, from the Chagres River to the Atrato. They are also known as Darien or San Blas Indians. They are of small stature, but athletic and of light complexion, many of them even approaching the blonde type. They formerly lived in villages of communal houses, cultivated corn and cotton, and worked gold obtained from the streams and mountains. The women were clothed, but the men usually went naked. They used poisoned arrows. They have never been entirely subdued, and still retain their love for freedom and wild life.

CUNARD', Sir SAMUEL (1787-1865). An English shipowner, born in Nova Scotia. He was the founder (1839) of the Cunard Line of ocean steamers plying between England and America. He was a member of the Royal Geographical Society, and was made a baronet in 1859.

CUNAX'A (Lat., from Gk. Κούναξα, *Kounaxa*). A place in Mesopotamia, on the eastern bank of the Euphrates, probably about 60 miles north of Babylon. It was the scene of the battle fought (B.C. 401) between Cyrus the Younger (assisted by a body of Greeks, the Ten Thousand) and his brother, Artaxerxes Mnemon, in which Cyrus was killed.

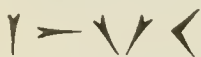
CUNDINAMARCA, kōōn'dē-ná-mār'ká. The central department of the Republic of Colombia, bounded by Boyacá on the north, Venezuela on the east, Cauca on the south, and Tolima on the west (Map: Colombia, C 3). Its area is estimated at over 79,000 square miles. The western portion belongs to the region of the Eastern Cordilleras, while the remainder forms a part of the Orinoco basin. Numerous rivers flow across it, the largest of which are the Guahibos and the Guayabero. All its streams are tributary to the Orinoco. The soil, with the exception of the

mountain regions, is very fertile, but only a small portion is cultivated. The chief crops are corn, wheat, coffee, tobacco, cacao, and sugar. The chief exports are cinchona and tobacco. Bogotá, the capital of the State of Cundinamarca, is also the capital of Colombia. Cundinamarca derives its name from an old American goddess, and before the conquest of the land by the Spaniards was one of the chief regions of native civilization, as is proved by numerous remains found in the State. The population in 1884, exclusive of aborigines, was 537,658.

CUNDURANGO, kûn'dû-rân'gô (Quichua, eagle-vine). A vine growing in northern South America. It contains a strong bitter principle, and was at one time claimed to be valuable in the cure of cancer, as a remedy for which it was sold in the United States at enormous prices. Subsequently it was found to be worthless for the cure of that disease, although it is still claimed to be valuable as a blood-purifier. It is not recognized in the American pharmacopœias, although it is still given in the German.


CUNEGONDE, kû'ne-gônd'. The mistress of Candide, in Voltaire's novel of that name.

CUNEIFORM, kû-nê'î-fôrm (from Lat. *cuneus*, wedge + *forma*, shape) **INSCRIPTIONS**. Cuneiform writing, one of the oldest systems of the alphabet which is known, originated in Mesopotamia, and spread, through the influence of Babylonia, even to Armenia and to Egypt. The earliest texts in cuneiform writing are at least six thousand years old, and the latest inscriptions are dated in the reign of Antiochus Soter, in the third century B.C. The script receives its name from the peculiar wedge-shaped characters of which it is composed. These consist of combinations of the five elements:



which become in many cases exceedingly complex. The difficulty of deciphering the characters is complicated by the fact that many of them are polyphonic, so that one cuneiform group may represent several entirely different combinations of sounds. In addition to their polyphonic character, all the varieties of cuneiform writing, with the exception of the Old Persian, are syllabic instead of alphabetic. That is, each character represents not a letter, but an entire syllable, or even a word. Furthermore, there are many ideograms in the script, conventionalized characters which do not denote the sounds for which they would naturally be supposed to stand, or which have no real phonetic value whatever. In the same way English possesses certain ideograms, such as lb., which is read pound; viz., pronounced namely; \$, which is dollar in speech; ♂ (the head and horns of the bull) as the astronomical sign for Taurus; and the like. It would seem that originally the cuneiform letters, like the Egyptian, Chinese, and Mexican alphabets, were pictorial, as, for instance, the older form of the character for sun (which may have been regarded as a complete

circle of time), , which later became

. On the other hand, it is doubtful whether the entire body of the extremely complex charac-





ters which make up the bulk of the cuneiform texts can be resolved into such simple elements. The form of the signs was undoubtedly influenced by the material on which the texts were inscribed. As the Germanic runes, which were carved on wood, are angular in shape and avoid curves, or as the Singhalese, which was written on palm-leaves, has almost no straight lines, which would split the leaf, but is composed of curves, so the cuneiform received its characteristic shape from the substance on which it was written. On the soft clay tablets, which were the ordinary writing material of Mesopotamia, the straight line was the easiest stroke, while the triangularly prismatic stylus by its heavy initial touch to the clay formed the peculiar arrow-shaped head of the wedge. These clay bricks, after the writing was finished, were carefully baked or dried in the sun. A chisel was of course employed for the longer inscriptions which were carved in the rock. The cuneiform text, unlike most other Semitic alphabets, as the Hebrew, Syriac, and Arabic, runs from left to right.



HISTORY OF DECIPHERMENT. The history of the decipherment of these alphabets is an interesting one. Although allusion is plainly made to cuneiform texts by Herodotus, Diodorus, Strabo, Plutarch, Arrian, and the epistles ascribed to Themistocles, all remembrance of them seems later to have been lost. Early European travelers to the East, however, were attracted by the mysterious signs, as early as Josafat Barbaro at the end of the fifteenth century, and especially Pietro della Valla in 1621, who seems to have been the first one to suspect that the inscriptions were something more than simple decorations of the rocks. His views, however, made no lasting impression, and the wildest theories were offered in explanation of the meaning of the signs. They were supposed to be talismans, or hieratic and astrological formulas, or it was thought that they might contain the original language of Eden. They were regarded as Greek by one investigator, while another found them pure Arabic. Gradually, however, the theories became more sober and accurate. The investigation centred from the very first about the most striking of all cuneiform inscriptions, the great trilingual text on the side of Behistun. On this steep mountain, which rises abruptly some seventeen hundred feet above the plain, there is carved at a height of three hundred feet an account of the reign of Darius I. in three languages which we now know to be Old Persian, Babylonian, and New Susian. Beginning with the discovery that

the Persian sign  denoted the end of a

word, and basing investigations on historical data furnished by Herodotus and other classical authors, and on hints as to word-order and style which were gained from Pahlavi (q.v.) inscriptions, successive investigations gradually deciphered the Old Persian cuneiform writing. It was then a comparatively easy task to solve the Babylonian and New Susian versions, which reproduce almost word for word the Old Persian text. From such a beginning the key has been found, not only to Assyro-Babylonian and New Susian, but to the Mitanni inscriptions and the tablets of Van and Cappadocia.

SUMERIAN CUNEIFORM INSCRIPTIONS. There are five chief forms of cuneiform alphabets—Sumerian or Accadian, Assyro-Babylonian, New Susian, Old Persian, and Armenian. Of these by far the oldest is the Sumerian, also called the hieratic, which was employed by the pre-Semitic inhabitants of Mesopotamia. This alphabet is ideographic in character, that is, the signs express not syllables, but concepts, and are, consequently, frequently pictorial in origin, as in the

case of  , heaven, god, which later became  , or  , dagger, later .


The numerical system, as in all the cuneiform alphabets, consists of simple wedges,  , for units, and angles,  , for tens. After sixty,

which, like the first digit, is represented by the simple vertical wedge, the system becomes sexagesimal.

ASSYRO-BABYLONIAN. The second alphabet, which is at once the most important and the most complicated of all, is the Assyro-Babylonian. This is the system, moreover, which had by far the longest use and the widest extent. Not only was it the medium of communication for the kingdoms of Assyria and Babylon, which for centuries controlled Mesopotamia, but it was employed by the kings in their messages to Egypt, as is shown by the rich discovery in 1887 of three hundred and twenty bricks inscribed with these characters at Tel-el-Amarna, which lies on the east bank of the Nile about one hundred and eighty miles south of Memphis. The writing is syllabic in character, and with the homophones, or different signs for the same sound, polyphones, or signs with various values, and ideograms, or pictorial representations, numbers some five hundred characters. The reading of these signs has been rendered possible by the discovery at Babylon of the so-called syllabaries. This class of tablets contains in the centre the phonogram, which is explained syllabically on one side and ideographically on the other. The reading of the Assyro-Babylonian inscriptions is further simplified by determinatives, which are found also in all the other cuneiform systems except Old Persian, as well as in Egyptian hieroglyphics. By these signs, which precede the word they determine, the noun is shown to denote a country, deity, or the like. Thus, in the Sumerian alphabet, one vertical wedge is the determinative for a man, three longitudinal wedges for a country, while in Assyro-Babylonian the sign for god, above noted, is the determinative for the name of a deity, and two vertical wedges indicate the dual number. The substances on which these inscriptions were cut were numerous. Not only clay bricks, as in the Tel-el-Amarna tablets, but also seals, stone obelisks, statues of bulls and lions, and the walls of the palaces were favorite places for texts to be inscribed. The writing is often exceedingly minute, some tablets having six lines to the inch, so that the complex characters must be read with the help of a magnifying glass. It is probable that the letters were cut with such assistance, as lenses of considerable power have been found among the ruins of the Mesopotamian cities. In

writing on sculpture the details of the carving were often entirely neglected, so that the lines of text are frequently carried over representations of portraiture or drapery. The clay tablets are of various sizes, some being as large as nine by six inches, while others are little more than an inch square. The character of the writing naturally varies, and there is of course a slight but constant change, so that the later Assyro-Babylonian cuneiform letters are distinctly different from the earlier. It would not be easy to overestimate the importance of the solution of the literature of Babylonia and Assyria. Not only in its contribution to our knowledge of the East, which had been almost a sealed book, is it of value. Almost more momentous still is the light which it has cast on the creation and deluge legends of Genesis, and its resultant value for Old Testament students.

NEW SUSIAN. The third variety of the cuneiform inscriptions, while ultimately derived from the Assyro-Babylonian system, is very much simpler. The name which should be assigned to it is somewhat doubtful. It has been called by no less than ten names—Median, Proto-Median, Medo-Scythian, Scythian, Elamitic, New Elamitic, Susian, Amardian, Anzanian, and New Susian. It is also termed the 'language of the second form,' in allusion to the fact that the only monument of it which has yet been discovered is the second of the Persian Aehgmians. The name which seems preferable and is adopted by the majority of scholars at present is New Susian. This system contains ninety-six syllabic signs, which at times, however, show a distinct approach to alphabetic values. Like the other cuneiform alphabets, the New Susian possesses ideograms and determinatives, having sixteen of the former and five of the latter. It is noteworthy that each ideogram, excepting for *zun-kuk*, king, which already has one determinative, is



followed by the determinative  , *id.* The

readings of the New Susian characters are in general fairly clear, although there is uncertainty about many words. The Old and Middle Susian inscriptions are still little known. Their study, should it prove successful, may help to solve some of the difficulties which still beset our knowledge of New Susian.

ARMENIAN. The cuneiform inscriptions which are found in Armenia, chiefly in the neighborhood of Van, and number over fifty, are written in a language which is related to the modern Georgian dialects. The inscriptions, which are probably to be dated from the ninth to the eighth century B.C., were first noted by Saint-Martin in 1823, and studied by Schulz, who was murdered by the Kurds in 1829, before his researches were completed. Despite the erroneous view held by one of the early investigators that the language of these texts was Armenian, while another more naturally tried to read them as Assyrian, researches into them were at last successful. The alphabet of the Armenian cuneiform inscriptions is an obvious modification of the Assyro-Babylonian characters. It is relatively extremely simple, since polyphones are discarded, and the number of signs is but one hundred and fifty-eight, including fifty-one ideo-

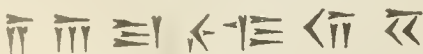
grams and seven determinatives. The type of this script, like the New Susian, forms a kind of transition between the Assyro-Babylonian and the Old Persian, since it has partly given up the syllabic system and often approximates the alphabetic form. Some of the determinatives, as those for god and man, and the numerical system, are borrowed from the Assyro-Babylonian system of writing.

OLD PERSIAN. The most simple of all the cuneiform systems, and the one which, as stated above, gave the key to all the others, is the Old Persian. This is employed from the sixth to the fourth century B.C. in the tablets of the Achæmæniens, Darius the Great, Xerxes, Artaxerxes I., II., and III., and Cyrus the Younger, together with a few seals of private persons. By far the most important text is that of Darius at Behistun, which is about four hundred and thirteen lines long. Other inscriptions, some of them of great value, are found at Persepolis, Susa, Naqsi-Rustam, Elvand, Kirman, Hamadan, and Murghab. In addition, there are shorter tablets at Van, where the most important Armenian inscriptions exist, and at Suez. The trilingual inscription of Behistun was known to Diodorus Siculus (q.v.) in the first century B.C., who says that the deeds of Semiramis were carved there 'in Syrian letters.' The Old Persian cuneiform characters are almost entirely alphabetic, each sign standing either for a vowel or for a consonant plus a vowel. Traces of the earlier syllabic system may perhaps exist in the case of characters which, like some of those found in the Armenian inscriptions, have different forms ac-

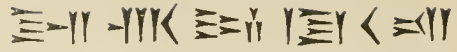
ording to the following vowel, as  , ja, but  , ji. The alphabet possesses thirty-

six letters, in addition to which there are four ideograms, for king, land, earth, and Ormazd. Polyphones and homophones are altogether lacking, and the only possible trace of a determinative is in the oblique wedge, already mentioned as the first character of any cuneiform alphabet to be deciphered, which marks the end of a word. While it is obvious that the Old Persian alphabet is derived from the later Assyro-Babylonian signs, just as the Achæmæniens were strongly influenced in their literary style by their non-Iranian predecessors, it is nevertheless not an easy task to trace the direct lineage of the letters of the single Iranian cuneiform alphabet to their Semitic originals.

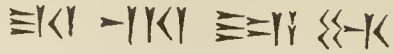
There still remain a number of Old Persian inscriptions which have never been published or even copied or photographed. It is not impossible that future investigations will add new Armenian tablets, or even New Susian texts, while it is practically certain that continued excavations will bring to light large masses of Sumerian and Assyro-Babylonian cuneiform inscriptions. The difference in the various alphabets of this system may be illustrated by reproducing the name of Darius in Old Persian, *Dārayavaush*; New Susian, *Tariyavaush*; and Babylonian, *Dāriyavush*:



OLD PERSIAN.



NEW SUSIAN.



BABYLONIAN.

BIBLIOGRAPHY. Taylor, *History of the Alphabet* (New York, 1900); Faulmann, *Geschichte der Schrift* (Vienna, 1880); Gobineau, *Traité des écritures cunéiformes* (Paris, 1864); Meunier, *Le syllabaire assyrien* (Paris, 1869-73); Les écritures cunéiformes (Paris, 1864); *Éléments d'épigraphie assyrienne* (Paris, 1880); Schrader, *Keilinschriften und Geschichtsforschung* (Giessen, 1872); *Die assyrisch-babylonischen Keilinschriften* (Leipzig, 1872); *Cuneiform Inscriptions and the Old Testament* (Eng. trans., London, 1897); Hommel, *Geschichte Babylonisch und Assyrisch* (Berlin, 1885); Strassmaier, *Alphabetisches Verzeichniss der assyrischen und akkadischen Wörter* (Leipzig, 1882-86); Amiaud and Méchineau, *Tableau comparé des écritures babyloniennes et assyriennes* (Paris, 1887); Bertin, *Grammar of the Cuneiform Inscriptions* (London, 1888); Brünnow, *Classified Lists of All Simple and Compound Cuneiform Ideographs* (3 vols., Leyden, 1887-97); Delitzsch, *Entstehung des ältesten Schriftsystems, oder der Ursprung der Keilschriftzeichen* (Leipzig, 1898); *Beiträge zur Entzifferung und Erklärung der kappadokischen Keilschrifttafeln* (Leipzig, 1893); Thureau-Dangin, *Recherches sur l'origine de l'écriture cunéiforme* (Paris, 1898-99); Sayce, "Cuneiform Inscriptions of Van," in *Journal of the Royal Asiatic Society*, new series xiv.; Sandalgian, *Les inscriptions cunéiformes waratiques* (Venice, 1900); Oppert, *Le peuple et la langue des Mèdes* (Paris, 1879); Weissbach, *Achæmideninschriften zweiter Art* (Leipzig, 1890); "Altpersische Inschriften," in Geiger and Kuhn's *Grundriss der iranischen Philologie* (Strassburg, 1896); Spiegel, *Altpersische Keilinschriften* (Leipzig, 1881).

CUNENE. See KUNENE.

CUNEO, *kōō'nā-ō* (dialectically called *Coni*). The capital of the province of the same name in North Italy, situated 55 miles south of Turin on a hill at the confluence of the Stura and the Gesso (Map: Italy, B 3). The town has a twelfth-century Franciscan church, a cathedral, and a city hall with a high tower. It markets grain, silk, and hemp in Lombardy, Switzerland, and Germany, and manufactures paper and fabrics of silk and wool. On account of its strategic importance as the key to the upper plains of Piedmont, and to the road that leads to Nice and Provence, Cuneo has often been besieged since it came into possession of the House of Savoy in 1382. Population (commune), in 1881, 24,853; in 1901, 27,065. Consult Bertano, *Storia di Cuneo* (Cuneo, 1898).

CUNHA, *kōō'n'yá*, TRISTÃO DA (1460-c.1540). A Portuguese navigator. He was at the head of an expedition to Africa and the Indies in company with Affonso d'Albuquerque. Afterwards he fought in Madagascar, and he was distinguished for his conduct in the East. In 1514 he was made special ambassador to present to Pope Leo X. the new possessions of Portugal. Upon

his return he was made one of the special council of the Crown. Da Cunha was the discoverer of three volcanic islands in the Atlantic, one of which bears his name.

CUNIBERT, SAINT (c.590-663). One of the earliest bishops of Cologne. He was consecrated in 623; was present at the synods of Rheims (625) and of Clichy (626), and soon took a place beside Pepin as one of the most influential men in the kingdom of the Franks. He educated Sigebert III. and other Merovingian princes; was prominent in the revision of the Salic and Ripuarian laws, and in drawing up the Alemannian and Bavarian codes, and spread the power of the Church over Saxony, Westphalia, Frisia, and part of France. He died after forty years in the bishopric.

CUNIMUND (c.510-566). The last King of the Gepidae. He was killed in 566 in a battle with the Lombards, to whose King, Alboin (q.v.), his daughter Rosamund was married.

CUNNER. A small, brown labroid fish, common in summer about all the eastern shores of the United States, where it affords amusement to hosts of amateur anglers who fish for it from wharves and anchored boats. It is closely allied to the tautog, but less valuable, and is variously known as burgall, chogset, blue perch, sea-perch, niffer, etc., and to ichthyologists as *Otenolabrus adspersus*.

CUNNINGHAM, Sir ALEXANDER (1814-93). An English soldier, archæologist, and author, born at Westminster. He studied at Addiscombe, went to India in 1833 as second lieutenant of Bengal engineers, and in 1836 was appointed an aide-de-camp to Lord Auckland. From 1836 to 1846 he was employed in military and engineering service, in 1846-49 was field-engineer in the Sikh wars, and in 1856, with rank of lieutenant-colonel, was appointed chief engineer of Burma. In 1858 he was appointed to a similar post in the Northwestern Provinces, and, as a major-general, retired in 1861. He was from that time until 1865, and again in 1870-85, archæological surveyor to the Indian Government. In that capacity he made extensive explorations, excavations, and drawings, gathered the most valuable collection of Indian coins yet made, and conducted important researches in the history of Buddhism as revealed by its architecture. His publications include: *Essay on the Arian Order of Architecture* (1848); *The Ancient Geography of India* (pt. i., 1871); *Corpus Inscriptionum Indicarum*, vol. i. (1877); *The Coins of Ancient India* (1891); and *The Coins of Mediæval India* (1894).

CUNNINGHAM, ALLAN (1784-1842). A Scottish poet and miscellaneous writer. He was born in the parish of Keir, Dumfriesshire. His father was for a time a neighbor of Burns, and Allan, as a boy, was present at the poet's funeral. At the age of eleven Cunningham was taken from school and apprenticed to his brother, who was a stone-mason; but his spare time was given to song and the collection of traditions. In 1810 he contributed largely to R. H. Cromek's *Remains of Nithsdale and Galloway Song*. The ballads in this collection, though purporting to be ancient popular songs, were Cunningham's own compositions. Removing to London just before this publication, Cunningham became one

of the best-known writers for the *London Magazine*. He subsequently obtained a situation in Chantrey's studio as foreman, or confidential manager, and this office he held till the sculptor's death. Among Cunningham's many works are *Songs, Chiefly in the Rural Dialect of Scotland* (1813); *Songs of Scotland, Ancient and Modern* (1825); several romances, and a drama; *Traditional Tales of the English and Scottish Peasantry* (1822); *Lives of the Most Eminent British Painters, Sculptors, etc.* (1829-33); and an admirable life of Burns. Cunningham is the author of a fine sea song, "A Wet Sheet and a Flowing Sea." He died in London. Consult Hogg, *Life*, with selections from works (London, 1875).

CUNNINGHAM, JOHN (1819-92). A Scottish divine. He was born at Paisley and was educated at the universities of Glasgow and Edinburgh. He was pastor at Crieff for forty-one years (1845-86). In 1886 he became Moderator of the General Assembly of the Church of Scotland, and in the same year was appointed professor of divinity at Saint Mary's College, Saint Andrews. His *Church History of Scotland*, first published in 1859, is the best work on this subject. His further publications include: *A New Theory of Knowing and Known, with Some Speculations on the Borderland of Psychology and Physiology* (1874); *The Quakers from Their Origin to the Present Time: An International History* (1868).

CUNNINGHAM, JOHN F. (1842—). An American Catholic divine. He was born in the parish of Irremore, County Kerry, Ireland, and was educated at Saint Benedict's College, Atchison, Kan., and at Saint Francis Seminary, Milwaukee, Wis. He took an important part in the development of the Catholic Church influence in Kansas, having been the first resident pastor of that Church to be appointed at Fort Scott (1865-68). In 1868 he was transferred to Lawrence.

CUNNINGHAM, PETER (1816-69). A British author, born in London, the son of the writer Allan Cunningham. He is best known by his *Hand-Book of London* (1849), a valuable work full of information. He also edited a number of the English classics; wrote a *Life of Drummond of Hawthornden* (1833); a *Life of Inigo Jones* (1848); and *The Story of Nell Gwynne* (1852); and was a contributor to numerous English periodicals.

CUNNINGHAM, RICHARD (1793-1835). A Scotch botanist, a brother of Allan Cunningham, the poet. He was born at Wimbleton. From 1808 to 1814 he worked on the *Hortus Kewensis* at Kensington; from 1814 to 1832 he acted as assistant to the King's gardener at Kew, and in the latter year was made Colonial Botanist and superintendent of the gardens at Sydney, Australia. After spending nearly a year in New Zealand, he returned to Australia in 1834, and in the following year, while out with an exploring party on the banks of the Darling River, he was murdered by the natives. He wrote *Two Years in New South Wales* (London, 1827).

CUNNINGHAM, WILLIAM (1805-61). An English theologian. He was born at Hamilton, Lanarkshire, and was educated at Edinburgh University. In 1834 he was appointed pastor of Trinity Church, Edinburgh, and after a visit to the United States for purposes of theological investigation became professor of theology in

the New College in 1843. He was widely known as a controversialist of exceptional ability, and used his abilities largely in the defense of Calvinism. Among his principal works are the following: *Historical Theology* (1862); *The Reformers and the Theology of the Reformations* (1862); and *Discussions on Church Principles* (1863).

CUNOBELINE, kŭ'nō-bē-lin. The legendary father of Caractacus, and King of the Silures.

CUOCO, kŭō-ō'kō, VINCENZO (1770-1823). An Italian historian, born at Cività-Campomorano (Province of Naples). He practiced law for a time at Naples, but was banished for participation in the revolutionary movement of 1799, and until his return in 1806 lived chiefly at Milan, where he edited the *Giornale Italiano* and published his *Saggio storico sulla rivoluzione di Napoli* (1800), a vivid and interesting narrative. From 1806 to 1816 he was director of the Treasury and a member of the Court of Cassation at Naples. Consult d'Ayala, *Vita di Vincenzo Cuoco* (Naples, 1861).

CUP (AS. *cuppe*, Icel. *koppur*, OHG. *choph*, cup, from Lat. *cupa*, cask, OChurch Slav. *kupa*, cup, Gk. *κύπη*, *kypē*, hollow, Skt. *kupa*, well). **DIVINATION BY**. A mode of foretelling events practiced by the ancient Egyptians, and still prevailing in some of the rural districts of England and Scotland. One of the Eastern methods consisted in throwing small pieces of gold or silver leaf into a cup of water, in which also were placed precious stones, with certain characters engraved upon them. The infernal powers were then invoked, and returned answer, either in an intelligible voice, or by signs, on the surface of the water, or by a representation in the cup of the person inquired about. By the modern method, a person's fortune is foretold by the disposition of the sediment in his tea-cup after pouring out the last of the liquid.

CUPANIA. See ⁶AKEE.

CUPAR, kŭō'pēr, or **CUPAR-FIFE**. A royal and municipal burgh, the county town of Fifeshire, Scotland, on the Eden, 32½ miles north of Edinburgh (Map: Scotland, E 3). It has several schools and a public library. The chief manufactures are linens, brick, and earthenware. A fortress of the Macduffs, thanes of Fife, once stood on a mound called the Castle Hill, at the east end of the town. Population (royal, Parliamentary, and municipal burgh), in 1901, 4511.

CU'PEL AND CU'PELLA'TION. See AS-SAYING.

CUPID (Lat. *cupido*, desire, from *cupere*, to desire). In classic mythology, the god of love; in Greek *Ἔρως*, *Erōs*, and also called in Latin *Amor*, love. Eros was worshiped at Thespie and Leutrea in Bœotia, and Parion on the Hellespont, as a very ancient god of productivity, and he also appears in the poets from the time of Hesiod as a personification of the power of love, which unites the gods and produces all things. In this aspect he is called offspring of Chaos, or of Heaven and Earth, or any such symbolical genealogy is assigned to him as pleased the fancy of a poet or philosopher. The prevailing conception, however, is that Eros is the son and inseparable companion of Aphrodite, though there is considerable confusion as to his father. In the earlier Greek art, Eros is a winged youth,

holding a flower or very commonly a lyre, and sometimes a whip, as symbol of his power. The bow and arrows, which were the common attributes in Hellenistic and Roman times, seem to have been introduced in the fourth century B.C., when Praxiteles and Lysippus represented the god in famous statues. Eros stretching the bow, probably influenced by Lysippus, shows the passage to the type which afterwards became universal, the chubby mischievous boy. The later Alexandrian and Roman literature, with its frequent mention of the love-gods, finds a reflection in the contemporary art. The artists of the time are exceeding fond of genre scenes, in which the actors are Cupids, who appear hunting, chariot-driving, making wine, selling their wares, or even playing like children.

CUPID, THE LETTER OF. A poem by Oeeleve, which was attributed to Chaucer in the edition of 1532, though bearing a date (1402) two years after the latter's death.

CUPID AND PSYCHE, sī'kē. (1) One of the tales narrated in the *Golden Ass* of Apuleius. Psyche, a princess, incurs the wrath of Venus, who sends Cupid to punish her; but he falls in love with his prospective victim and visits her, cloaked in invisibility. He commands her not to attempt to see him. Curiosity leads her to disobey, and the lovers are separated. The pity of Jupiter, however, finally unites them for eternity. The episode has been frequently translated and imitated. (2) A graceful antique marble in the Capitoline Museum at Rome, a copy of a Greek original. Cupid, undraped, embraces Psyche, who is draped from the hips. The statue was found on the Aventine.

CUPID'S REVENGE. The title of an inferior comedy by Beaumont and Fletcher, showing strong resemblance to Sidney's *Arcadia*.

CU'POLA (It., dome, from Lat. *cupula*, *cupule*, little cup, *cupola*, dim. of Lat. *cupa*, cask). A spherical vault or ceiling used to cover a building, so called from its resemblance to a cup. Cupolas are hemispherical, or of any other curve, and may be made of any material, stone, brick, wood, metal, or glass. The term *cupola* is distinguished from *dome* (q.v.), because it applies only to the inner surface of the covering, while the term *dome* covers the entire curved structure. In popular but incorrect usage, a *cupola* is a small termination on a roof, often a sort of lantern on the top of a dome (e.g. that of Saint Peter's), for an egress or look-out. In late Byzantine, in Mohammedan, and in Russian domes especially, the inner shell or *cupola* differed essentially in shape from the outer shell, a low inner face being often surmounted by a high pointed or bulbous roofing for effect. This was also the case at Saint Mark's, Venice. The Mes-jid-i-Shah mosque at Ispahan and the Um-es-Sultan mausoleum at Cairo are Eastern examples. In later architecture this is illustrated in the dome of the Invalides in Paris and Saint Paul's, London.

CUPPING. The application of cups, from which the air has been exhausted, to the skin, with the object of causing congestion or excessive fullness of the cutaneous blood-vessels; and if it should be thought desirable to withdraw some blood, the skin may be cut or scarified, and the exhausted cups applied over the incisions, to favor its flow. The two procedures are respect-

ively called 'dry' and 'wet cupping.' Cups are made of glass, with round mouths, from two inches to one inch wide. The cup is held near the skin and the flame of an alcohol lamp is thrust into it till part of the air is driven out by expansion. The flame is then withdrawn and the cup is quickly inverted on the skin, to which it adheres on account of the partial vacuum formed on cooling. The 'French cup' is provided with a rubber bulb connected with its interior. The bulb is grasped as the cup is applied, driving out the air, and when the cup is in position the bulb is allowed to expand and fill, thus exhausting part of the air in the cup. Wet cupping should be done under antiseptic precautions.

CUPRES'SUS. See **CYPRESS.**

CUPRITE (from Lat. *cuprum*, copper). A red cuprous oxide that crystallizes in the isometric system and has an adamantine or submetallic lustre. It occurs in Thuringia and Tuscany, in Cornwall and elsewhere in England; also abundantly in Chile, Peru, and Bolivia; and in the United States with various copper ores in the Lake Superior region, Missouri, and Arizona. It is found occasionally as a furnace product.

CUPULE (Neo-Lat. *cupula*, dim. of Lat. *cupa*, cask). A word with at least two distinct applications among plants. Among seed-plants it refers to a peculiar involucre of coalesced bracts, such as the acorn 'cup,' and the husk of beechnuts, hazelnuts, etc. Among liverworts (as *Marchantia*) it refers to a cup-like structure that appears on the plant body and contains the peculiar reproductive bodies called 'gemmæ.' See **HEPATICÆ.**

CUPULIFERÆ (Neo-Lat. nom. pl., from *cupula*, cupule, little cup, eupola + Lat. *ferre*, to bear). The oak family. This order of Bentham and Hooker is divided by other botanists into several, the principal species being placed in *Fagaceæ* by Engler and the remainder included in *Betulaceæ*. This is one of the most important orders of dicotyledonous plants when their uses are considered. To it belong the oak, chestnut, and beech (q.v.), which are among our most valued deciduous forest trees. The order is composed of monoëcious trees and shrubs with alternate simple, straight-veined leaves, deciduous stipules; fertile flowers borne singly or clustered, sterile ones in catkins. The fruit is a nut inclosed in a cupule of coalesced bracts. In the oaks the nuts are borne singly in the cupule and more or less inclosed by it. With the beeches two three-angled nuts are formed within the cupule, which opens by four valves. The chestnuts have three nuts within a spiny bur, which opens by two or four valves when ripe. As limited by Engler, there are but four or five genera and about 350 species in this order, the principal genera being *Quercus*, *Castanea*, and *Fagus*. The first two are found indigenous only in extra-tropical regions of the Northern Hemisphere, while *Fagus* occurs in the same region and is represented by the sub-genus *Nothofagus* in South America, New Zealand, and Australia.

CURA, *koo'rá*, or **CIUDAD DE CURA**. A city of Venezuela, formerly capital of the State of Miranda, situated near Lake Valencia, 1600 feet above sea-level (Map: Venezuela, D 2). Owing to its position near the llanos of the Guárico, it has considerable trade as the centre of a cotton-growing, agricultural, and stock-raising region.

Cura, founded in 1730, suffered considerably in the War of Independence. In 1900 it was visited by a destructive earthquake. Population, in 1889, 12,198.

CURAÇAO, *koo'rá-sü'ó* or *koo'rá-só'*. One of the Dutch West India islands lying in the southern part of the Caribbean Sea (Map: West Indies, N 8). It is situated about 41 miles north of Venezuela, in latitude 12° N. and longitude 69° W., and covers an area of 210 square miles. Its surface is generally flat, with the exception of the southwestern part, where some of the elevations reach about 1200 feet. The lowlands are mostly of coral formation, and the coasts are bordered with a number of lagoons. Streams are few, and the rainfall light. Sugar, tobacco, corn, and fruits are raised, but a considerable part of the island is uncultivable on account of the lack of water. The principal minerals worked are salt and phosphate. The commerce of Curaçao is chiefly with the adjacent islands and the United States, which sends the larger part of the imports. No figures for the exports of the island are obtainable, as there are no export duties in Curaçao, but the imports for 1899 were valued at over \$770,000. The island of Curaçao, together with the adjacent Dutch islands of Buen Ayre, Oruba, a part of Saint Martin, Saint Eustache, and Saba, form a separate colony officially called Curaçao, administered by a governor, assisted by a council of four members and a colonial council of eight members. The smaller islands are administered by subordinate officials. The members of both councils, as well as the minor officials, are nominated by the sovereign. The population of Curaçao in 1899 was 30,119 and that of the colony, 51,693. The capital of the colony of Curaçao is Willemstad, on Curaçao, a well-built town with a good harbor. Curaçao was occupied by the Spanish in 1527 and fell into the hands of the Dutch in 1634. After a period of eight years under English rule the island was returned to the Dutch in 1815. There is a United States Consul on the island. Consult Dissel, *Curaçao* (Leyden, 1857).

CURAÇAO, *koo'rá-só'* (so called from the peel of the Curaçao orange). A well-known and palatable liqueur, made from orange-peel by digesting in sweetened spirits, with certain spices, as cinnamon, mace, or cloves. See **LIQUEURS.**

CURANA (*koo-rá'ná*) **WOOD.** See **PROTIUM.**

CURARI, *koo-rá'rè* (South American), **CURARE**, **OURARI**, **URARI**, **WOORALI**, or **WOORARA**. A celebrated poison used by some tribes of South American Indians for poisoning their arrows. It is by means of this poison that the small arrows shot from the blow-pipe become so deadly. The nature and source of this poison remained long unknown, the Indians being very unwilling to reveal the secret, which seems, however, to have been at last obtained from them by Sir Robert Schonburgk, and it is now regarded as pretty certain that the principal ingredient is the juice of the *Strychnos toxifera*, a tree or shrub of the same genus with that which yields *nux vomica*. (See **STRYCHNOS.**) It has a climbing stem, thickly covered with long, spreading, reddish hairs; rough, ovate, pointed leaves; and large, round fruit. The poison, when introduced

into the blood, acts on the end plates of the muscles, peripheral end organs of the motor nerves, causing complete paralysis without affecting consciousness, sensation, circulation, or respiration except indirectly. Convulsions are due to the asphyxia which results from paralysis of the muscles concerned in respiration. Death finally occurs from this respiratory paralysis. Curari is supposed to be the most powerful sedative known. Artificial respiration is the most efficacious means of preventing its effects. It has been proposed to employ it in the cure of lockjaw and hydrophobia, but it merely stops the convulsions and is itself very dangerous on account of the liability to paralysis of the respiratory muscles. Like snake-poison, it is comparatively inert when taken into the stomach.

CURASSOW (from *Curacao*, an island in the Caribbean Sea), or properly CURAÇAO BIRD. A large gallinaceous bird of the genus *Crax*, of the family Cracidae, having a strong bill surrounded at the base with a skin—sometimes brightly colored—in which the nostrils are pierced, and the head adorned with a crest of feathers curled forward, which can be raised and depressed at pleasure. They are natives of the forests of the warm parts of America. They congregate in flocks, and although they live much among the branches of trees, their habits greatly resemble those of domestic poultry. They make large, clumsy nests in trees and lay white eggs. They are very unsuspecting of danger, until taught by severe experience, and are easily domesticated. The best-known species, the Curacao bird (*Crax alector*), is about the size of a turkey; its plumage is almost entirely black. It is abundant in the forests of Guiana. Its flesh is very good eating. It is kept in poultry-yards in South America, and was introduced into Holland at the close of the last century, where it seemed completely acclimated, but the stock has never become widespread. For this point consult Dixon, *The Dovecote and the Aviary* (London, 1853); for general facts see Selater's illustrated papers in the *Transactions of the Zoölogical Society of London*, vol. ix. (London, 1877). Compare CHACHALACA, GUAN, and HOCCO; and see PLATE OF GROUSE, ETC.

CURATE (ML. *curatus*, from Lat. *cura*, cure, care). One who has the cure of souls. In this sense it is used in the phrase of the English Prayer-book, 'all bishops and curates,' and similarly in France the word *curé* denotes the parish priest. In modern popular usage, however, in England, and to some extent in America, the word is applied to assistant clergymen. A few incumbents in England hold what are known as perpetual curacies and are practically the same as vicarages.

CURATE OF LOS PALACIOS, lós pá-lá-thê-ós (Sp. *Cura de Los Palacios*). The pseudonym of Andres Bernaldez, the Spanish historian.

CURB (from OF. *courber*, *corber*, *curber*, Fr. *courber*, It. *curvare*, from Lat. *curvare*, to bend, from *curvus*, curved, OChurch Slav. *krivŭ*, Lith. *kreivas*, crooked). A strain of the straight ligament in the rear of the hock of horses. Swelling appears on the inner and back part of the joint, generally causing lameness, which is most apparent in trotting, and, in slight cases, usually wears off after the animal has been out for ten minutes. It may be

most readily detected by standing at one side and looking across the joint. Fomentations must first be used to allay the irritation and inflammation; when heat and tenderness disappear, cold applications will be advisable; and if, after ten days, the enlargement still continues, a blister may be necessary. All work should be suspended.

CURBINA, kūr-bē'ná. See DRUM, OR DRUM-FISH.

CURCI, kūr'ehê, CARLO MARIA (1809-90). An Italian priest and author, born in Naples. He became in 1850 the founder of the *Civiltà Cattolica*, a journal which stood for the rehabilitation of the temporal power of the Pope. But Curci later retracted these opinions and in 1877 published the reasons for his opposition to the policy of Pius IX. This forced him to leave the Society of Jesus, but afterwards Leo XIII. induced him to recant to some extent, and he continued more favorable to the policy of the Vatican until the publication of his books, *La nuova Italia* (1880); *Il Vaticano regio* (1883); and *Lo scandalo del Vaticano regio* (1884). These works were immediately placed upon the Index. Toward the end of his life Curci retracted again, and died in the communion of the Church.

CURCULIONIDÆ (Neo-Lat. nòm. pl., from Lat. *curculio*, *gurgulio*, weevil). A large family of rhynchophorous beetles; snout-beetles. See WEEVIL; PLUM CURCULIO.

CUR'CUMA (It., Fr. *curcuma*, from Ar. *kurkum*, saffron). A genus of plants of the natural order Zingiberaceæ (or Scitamineæ according to some botanists), having the tube of the corolla gradually enlarged upward, and the limb two-lipped, each lip three-parted. The species are stemless plants, with tuberous roots, natives of the East Indies. The dried roots of *Curcuma zedoaria* are the zedoary (q.v.) of the shops; the roots of *Curcuma longa* yield turmeric (q.v.); and *Curcuma angustifolia* yields a kind of arrowroot (q.v.). The same species often yields both arrowroot and turmeric, the former being obtained from the young roots, the latter from the old. *Curcuma amada* is called mango ginger. Its root when fresh has the smell of a mango, and in its qualities resembles ginger. It is a native of Bengal.

CURD. See CHEESE.

CURÉ DE MEUDON, kūr'á' de mē'dón', LE (Fr., the curate of Meudon). The name frequently given to Rabelais, whose last charge was at Meudon.

CURE FOR A CUCKOLD. The title of a play by Webster and Rowley (1661), also attributed to Middleton and Rowley.

CURES, kūr'tez (from Sabine *curis*, *quiris*, spear). A town of the Sabines. It was situated about twenty-five miles from Rome, near the Tiber, and was the birthplace of Titus Tatius. (See ROMULUS.) The term *Quirites*, as applied to the Roman people, is supposed to have come from Cures. The town was destroyed by the Lombards near the close of the sixth century. It stood not far from the modern Corresi. See QUIRITES.

CURETES, kūr-rē'tez (Lat., from Gk. *Κουρήτες*, *Kourētes*, connected by Hesychius with Gk. *κουρά*, *koura*, a cutting of the hair, in allusion

to their mode of wearing their hair). Cretan demigods who protected the infant Zeus from his father Cronus, when the latter swallowed his other children, by drowning his cries with the clanking of their brazen weapons. They are sometimes identified with the Corybantes.

CURETON, kūr'ton, WILLIAM (1808-64). An English Syriac scholar. He was born at Westbury, became Canon of Westminster and rector of Saint Margaret's, London, in 1849. He died in London, June 17, 1864. His fame rests upon his Syriac studies: *Corpus Ignatianum* (1849); *Four Gospels in Syriac* (1858); *Ancient Syriac Documents Relative to the Earliest Establishment of Christianity in Edessa and the Neighboring Countries* (1864).

CURETU, koo-rá'too. A tribe of Tapuyan stock occupying the country between the Yapura and Uaupés Rivers, on the Brazil-Colombia border. They are a peaceable people, living in circular thatched houses and cultivating corn and manioc. The men paint their bodies and wear woolen girdles, but the women go entirely naked.

CURFEW (OF. *courfeu*, *corfeu*, from *cucrefeu*, *cocrefeu*, *covrefeu*, *covrefeu*, cover-fire, from *cocrir*, Fr. *couvrir*, to cover + *feu*, fire). In the Middle Ages, the ringing of a bell at night as a signal for the cessation of all outdoor life. The custom existed as a general police regulation, providing that after 8 o'clock all fires must be covered, and people keep within their houses. Polydore Vergil attributes to William the Conqueror the introduction of the curfew-bell into England, but the custom prevailed throughout Europe long before his time. There was so much opposition to the ordinance in England that Henry I., in 1103, abolished it. The curfew is mentioned in English laws for more than a century afterwards, but Blackstone says it refers to the time of night, and not to the ordinance. In parts of the United States and England the curfew-bell is still rung; in some towns of the former it is a police regulation to warn children off the streets.

CURIA (Lat., court). In Roman history, the name of a division of a tribe in the constitution of Romulus. The tribes being three and the divisions ten, there were thirty curia. This division was a division of the *populus* to the exclusion of the *plebs*; and the assembly of the *populus* was called the *comitia curiata*. (See *COMITIA*.) *Curia* is also the name given to the Senate-house in ancient Rome.

CURIA MURIA (koo'ri-á moo'ri-á) ISLANDS. See KURIA MURIA ISLANDS.

CURIA RE'GIS (Lat.), or KING'S COURT. The ancient supreme court of England, known also as the *Aula Regia*, or Royal Hall (of Justice). It was instituted by William the Conqueror as the instrument of his judicial authority as supreme head of the State, and, exercising, as it did, a general and practically unlimited jurisdiction, it rapidly drew to itself all the important litigation of the kingdom. There had been no analogous tribunal under the Saxon kings, the popular county courts being in all ordinary cases supreme within their respective counties (shires), and a centralized administration of justice being foreign to the sentiments and traditions of the English people.

Among the Normans, however, it was the duke or king, and not the people, from whom the stream of justice flowed, and the followers of the Conqueror could hardly be expected to subject their causes—their land-titles, their exactions, their controversies over tithes and preferments—to the judgment of the popular tribunals. It was in the County Court of the County of Kent, however, that a great case, involving the title to twenty-five manors, between the Archbishop of Canterbury and Odo, the Bishop of Bayeux and Earl of Kent, the half-brother of the King, was tried and adjudged in the tenth year of the Conqueror, and cases of this kind were not uncommon in the earlier years of William's reign.

But the older tribunals could not long compete with the immediate jurisdiction of the King, at first administered by him in person, and then by the chief justiciar, an officer of almost royal authority and importance. All important causes, public and private, whether civil, criminal, or ecclesiastical, might be brought before the King's court in the first instance, and judgments of the county courts and other local tribunals were subject to be appealed and brought before it for review. Its disinterestedness contributed as much as its authority to invest it with the function of the principal court in the kingdom for the adjudication of private controversies, and the position of the justiciar, as the chief executive and military officer, as well as the highest judicial officer in the kingdom, added to the weight of its judgments.

The *Curia Regis* early became a peripatetic or circuit court, attending the King, or, in his absence from the realm, the justiciar, in his frequent progresses through the kingdom, and this, in the course of time, became a great abuse, amounting in many cases to a denial of justice. To remedy this, it was provided in Magna Charta (Sec. 17) that common pleas—that is, causes between private parties—should not follow the court, but be heard in a fixed place. The establishment, thereupon, of a distinct Court of Common Pleas, in the reign of Henry III., to sit permanently at Westminster, was the beginning of the dissolution of the *Curia Regis*. A separate division of the court, known as the King's Court of the Exchequer, had previously been created for determining questions relating to the royal exchequer. When in the same reign a Chancellor of the Exchequer was appointed as the permanent head of this department, it also became a separate and distinct tribunal. Finally, in the fifty-second year of Henry III., a third court, thenceforth known as the Court of King's Bench, was created and took over the remaining jurisdiction of the *Curia Regis*. Thus, the latter, though never formally abolished, lost its importance and became obsolete, after two hundred years of greatness. The last justiciar of the King's Court, Robert de Brus, became the first Chief Justice of the King's Bench in 1268, and with him the line of great justiciars became extinct. From that time to the reform of the judicial system of Great Britain in 1873-75, England lacked a single supreme court, but the model of the *Curia Regis* of the Norman kings was followed in the creation of the Supreme Court of Judicature, by which justice is administered in England to-day. See COURT; SUPREME COURT.

Consult: Thorpe, *The Ancient Laws and Institutes of England* (London, 1840); Stubbs,

Constitutional History of England (Oxford, 1883); Stephens, *History of the Criminal Law* (London, 1883); *Essays in Anglo-Saxon Law* (Boston, 1876); Dugdale, *Origines Juridicales; or, Historical Memorials of the English Laws*, etc. (London, 1666); Underwick, *The King's Peace, a Historical Sketch of English Law Courts* (London, 1895); Pollock and Maitland, *History of English Law* (2d ed., London and Boston, 1889); Digby, *An Introduction to the History of the Law of Real Property* (5th ed., Oxford, 1899).

CURIATII, kūr'ā'shī-ī. The tribal name of three Alban brothers, the opponents of the three Horatii (q.v.) in the famous contest by which Alba became subject to Rome. They were successively slain by the surviving Horatius after his two brothers had been killed. The story is finely told in Corneille's tragedy *Horace*.

CURICANCHA, kūr'rē-kān'chā (Quichua, court of gold). A temple of the sun, said to have been founded by Manco Capac, in Cuzco, Peru, and to have been first used as a palace by the early Incas. The church and convent of Santo Domingo were built upon its site, soon after its demolition during the Spanish Conquest. Only irregular portions of its walls now remain, surrounded by the structure of the more modern edifice.

CURICÓ, kūr'rē-kō'. The capital of the Province of Curicó, Chile (Map: Chile, C 10), situated, at an elevation of 800 feet above sea-level, 108 miles south of Santiago. It is connected with Santiago by railroad, and has considerable trade with Argentina through the Planchón Pass. Curicó was settled in 1743, though not on its present site. Population, in 1899, 17,638.

CUR'IO (clipped from *curiosity*). A term still popularly used, though somewhat obsolete, to describe any kind of object of curiosity, especially such as would belong to cabinet (q.v.) collections, on account of antiquity, rarity, unusual association, or intrinsic interest, in such domains as pottery, porcelain, enamels, metal-work, ivories, wood-carvings, arms, clocks, fans, watches, snuff-boxes, musical instruments, and the like. The kind of indiscriminate, unscientific collection that could be called by this name is going out of fashion, and the term with it.

CURIOSITIES OF LITERATURE. A work in six volumes by Isaac D'Israeli, which appeared without indication of its authorship, at intervals from 1791 to 1824.

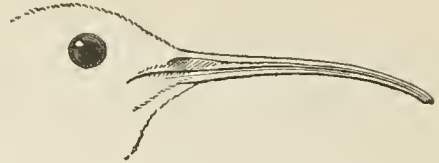
CURIOS IMPERTINENT, THE. A tale in Cervantes's *Don Quixote*, in which the 'Curious Impertinent' tries the fidelity of his trusted wife through the agency of a friend, and is deceived by both. The story is used by Crowe in *The Married Beau, or the Curious Impertinent*.

CURISCHES HAFF, kūr'rīsh-es häf. See KURISCHES HAFF.

CURITIBA, kūr'rē-tā'bā. The capital of the State of Paraná, Brazil (Map: Brazil, H 9), situated on Iguazú River, in a fertile plain, 3200 feet above sea-level. It is well built, and has a high school and a street railway. Railroads run to the interior and to the coast, and the town exports corn, beef, fruit, tobacco, and Paraguay tea. There are gold-mines in the vicinity. Curitiba was settled in 1654, and since 1831 has been

the capital of the State. Population, about 10,000.

CURLEW (OF. *corlicu*, It. *chiurlo*; probably onomatopoeitic in origin). A shore-bird of the genus *Numenius*, and snipe family, characterized especially by its long, slender, downward-curving bill, and its liking for upland plains rather than



BILL OF ESKIMO CURLEW.

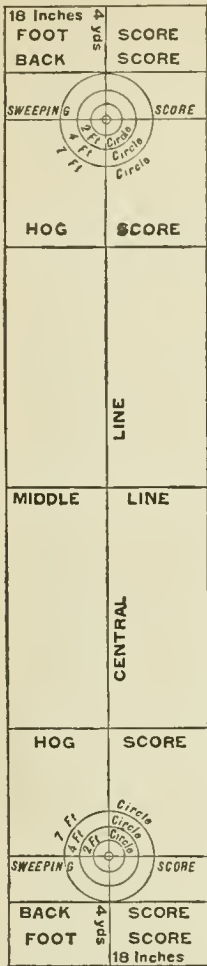
marshy places. In America are the Hudsonian or Jack curlew (*Numenius Hudsonicus*), the Eskimo curlew, or doe-bird (*Numenius borealis*), and the long-billed curlew (*Numenius longirostris*). The first two are found in summer in far Arctic regions and in winter as far south as Patagonia, so that during some part of the year they occur in most portions of the Western Hemisphere. The long-billed, whose beak is sometimes eight inches long, belongs in the eastern and central United States, especially at the South, and on the Northwestern prairies. Its nest, like that of other curlews, is on the ground, and slightly constructed, and the eggs are clay-colored, with various brown markings.

The common curlew of Great Britain (*Numenius arquatus*), the 'whaup' of the Scotch, has an almost world-wide distribution in the Old World, migrating even to New Zealand. It frequents the grassy moors of England and Scotland in summer, and its whistle is one of the characteristics of those upland scenes. Its flesh and eggs are both eaten. Other Old World species are the whimbrel (*Numenius phaeopus*) and the Otahiti curlew (*Numenius Taitensis*), of the Pacific islands, often called the bristle-bellied curlew, because the feathers of the belly are tipped with glistening bristles. Consult: Coues, *Birds of the Northwest* (Washington, 1874); and Selous, *Bird Watching* (London, 1901). See Plate of BEACH-BIRDS.

CURLING (so called from the twisting motion of the curling-stones). This has the unique distinction of being the only ancient game about which there is no ambiguity as to its place of origin; it is purely a Scottish game, and wherever Scotchmen have gone, there the game flourishes. Associated with the parent body to-day, 'The Royal Curling Club of Scotland,' are clubs in England, Ireland, Canada, Newfoundland, New Zealand, Nova Scotia, the United States, Russia, and Switzerland.

There are two curling games—the rink play and 'playing for points.' The rink game is played on any piece of ice, upon which may be platted out a rink 42 yards long (occasionally 32 yards) and 10 yards wide. There are four players on each side, each using two stones of circular shape, not heavier than 44 pounds, and not of greater circumference than 36 inches, though in Canada, where iron has to be used instead of stone, they weigh from 60 to 70 pounds. Each player in turn takes his position on the crampet or iron foothold at one end of the rink, and propels his stone as near to the tee, 38 yards

off, as he can. The next man of the opposite side then projects one of his stones still nearer, if possible, and so the game proceeds until each has cast his two stones, after which the end, or 'head,' is counted. A stone is of no use unless it reaches the mark called the 'hog score,' and of no value if it passes out of the parish, which is a seven-foot ring drawn round the tee. All the stones that stay within the parish are counted, and that side wins which has the greatest number of stones nearest the tee.



It is permitted during the game for one side to aim at its opponents' stones, and to knock them out of the circle if possible. The sweeping of the ice, an important feature of the game, is under the direction of one player of each side called the 'skip.' The player's party may sweep the ice from the hog score next to the player to the tee; but when snow is falling the ice may be swept from tee to tee. In the 'point' game there are no sides; each player has two stones to throw, and other stones are placed round the tee for him to make his points by placing his ball, or displacing the other balls from the positions in which they have been placed. Originally, the stones were simply rounded stones, taken from the channel of a river; but about the middle of the eighteenth century they

were improved by chiseling, and later handles were introduced. Now each stone has usually two sides: one so curved that it runs as on a pivot and highly polished for use on dull ice, and the other less polished, but with a larger concave or hollow, to give it a better catch or hold on keen, clean ice. A set of matches is called a 'bonspiel.' There are international bonspiels between the United States and Canada, and interstate matches yearly at Montreal, Winnipeg, Ottawa, Hamilton, Toronto, Saint Paul, Minneapolis, Duluth, Chicago, Buffalo, and Hoboken, N. J. Numerous trophies are contested for, among which are the International Trophy, the Quebec Challenge Cup, the Grand Challenge Cup of Manitoba, the Caledonian Tankard, the Vice-regal Tankard, the Merrian Trophy, and the Gordon-Mitchell and Smith medals. Consult: Ramsay, *An Account of the Game of Curling* (the earliest history of the game, Edinburgh, 1811); Taylor, *Curling, the Ancient Game* (Edinburgh, 1877); Kerr, *History of Curling* (Edinburgh, 1890).

CURLL, EDMUND (1675-1747). An English bookseller. From 1706 at the sign of the Peacock, outside Temple Bar, and from 1735 at that of the Pope's Head, Rose Street, Covent Garden, he dispensed literature and—its concomitant in those days—patent medicine. He seems continually to have been involved in quarrels, and many of his publications were of the character of vindications and explanations. His most memorable contentions were with Pope, who devoted to him some of the least complimentary lines of the *Dunciad*. Numerous standard works displayed his imprint, and many volumes were edited by him.

CURRACH, COURACH, kūr'rá or kur'rák, or **COR'ACLE** (Gael., Ir. *curach*, Welsh *corve*, boat). The name given in the British Islands to a canoe or boat, made of a slender frame of wood, covered with skins. Skiffs of this sort, as well as canoes hollowed out of the trunks of oaks, were in use among the Britons in the earliest times of which we have record. Julius Cæsar, who built some of them after the British model, tells us that the keel and gunwales were of light wood, and the sides of wicker, covered with hides. Similar descriptions of the Currach are given by Pliny, Lucan, Solinus, Festus Avienus, Sidonius Apollinaris, and others. The first occurrence of the name seems to be in Gildas, who wrote in the sixth century; he speaks of the currach as in use among the Scots and the Piets. A long voyage in the North Sea, made in a currach during the same century, by one of the companions of Saint Columba, is commemorated by Adamnan, who died in 704. In 878 three Irish missionaries sailed in a currach from Ireland to Cornwall; the voyage occupied seven days, and the size of the currach is indicated by the remark that it was one of two skins and a half. An old life of Saint Patrick speaks of a currach "of one skin, with neither helm nor oar." The currach of a larger size had a mast and sail. The currach still continues to be used on the Severn, and on many parts of the Irish coast, especially on the shores of Clare and Donegal. The last one known to have been used in Scotland is in the museum at Elgin. It was employed on the Spey, toward the end of the nineteenth century.

CURRAGH OF KILDARE, THE. A famous race-track and the seat of a military school in County Kildare, Ireland. The plain is about six miles long.

CUR'AN, CHARLES COURTNEY (1861—). An American painter, born at Frankfort, Ky. He studied in New York at the Art Students' League, and in Paris under Duet, Lefebvre, and Benjamin-Constant. In 1888 he won the third Hallgarten prize, and in 1890 honorable mention at the Paris Salon. He became a member of the Society of American Artists and of the National Academy in 1888. There are pictures by him in the Chicago Art Institute and at Vassar College. His work is skillful, refined, and soft in color. Several of his pictures are highly imaginative, especially "The Dream."

CURRAN, JOHN PHILPOT (1750-1817). An Irish judge and orator. He was born at Newmarket, Cork County, July 24, 1750, and educated at Trinity College, Dublin, where he was more dissipated than studious. In 1773 he went to London and studied law assiduously at the

Middle Temple. He was called to the Irish bar in 1775, and soon won success by his ability and social qualities. He was an expert cross-examiner and possessed a thorough acquaintance with every intricacy of the cunning native mind. In 1782 he became member for Kilbeggan in the Irish Parliament and supported a liberal policy. His sarcasm led him into several fortunately harmless duels. In 1788 he favored the formation of an Irish volunteer army corps, and eloquently protested against the English policy which led to the rebellion of 1798. His fearless defense of the leaders at the State trials, and Robert Emmet's affection for his daughter, the heroine of Moore's pathetic poem, led to Curran's examination before the Privy Council, but he was found guiltless of complicity. He bitterly opposed the Union, as the 'annihilation of Ireland'; and its consummation, crowding on domestic trouble, seriously impaired his health. After the death of Pitt, Fox appointed him Master of the Rolls with a seat in the Privy Council. He held the office from 1806-13, and retired on a pension. As a distinguished man among the brilliant men of the period, he spent the last three years of his life in London, where he died, October 14, 1817. His memory is preserved by excellent examples of sparkling wit and repartee found in various memoirs. Consult: Phillips, *Recollections of Curran and His Contemporaries* (London, 1850); Curran, *Life of Curran* (London, 1819; New York, 1855); Stephens, *Memoir* (London, 1817); O'Regan, *Memoir* (London, 1817); and *Curran's Speeches*, with a *Life*, edited by Davis (Dublin, 1855).

CURRANT (Fr. *corinthe*, It. *corintho*, currant, from Lat. *Corinthus*, Gk. *Κόρινθος*, *Korinthos*, Corinth; so called as being originally exported from that city). A name used to designate some fruits of the genus *Vitis*, as well as both the plant and fruit of the genus *Ribes*. Originally this term seems to have been applied to the small raisins which are now a common commercial article much used in cookery. In general the term currant is applied to both the plant and fruit of those species of the genus *Ribes* that have no thorns and bear their fruits in bunches or clusters like grapes. *Ribes rubrum* may be taken as a type. This group is found chiefly in the northern half of the north temperate zone. In Europe it is wild, and occurs in England and on the Continent as far north as Kamechatka, although it is not found in the Mediterranean countries. In America it is found in Canada, and both eastern and western United States. Having a northern origin, it has proved a most valuable plant in the Northwest, where few cultivated fruits thrive without protection. The currant is found in almost every fruit garden throughout the northern United States and Canada, and is cultivated to a considerable extent commercially.

Ribes rubrum, from which our red and white varieties are derived, is the most important member of this group, both in America and Europe. (For illustration, see Plate of CYPRESS.) It grows best on a strong, moist loam, with a northern exposure or partial shade. For this reason it is often planted in orchards and on the north side of buildings. It is generally propagated by hardwood cuttings, six to ten inches long, taken in the early fall. The plants are set about four feet apart in rows six feet apart. Frequent and shall-

ow cultivation is given, and good results are often secured by mulching. Not much pruning is required. The old wood should be thinned out each year, none over three years old being allowed to remain. Red varieties are the ones chiefly grown for market. The white sorts are sweeter, but not so popular. Both white and red varieties are extensively used in the preparation of jellies and jams, and for wine-making. Black currants (*Ribes nigrum*) are little grown in the United States, but are extensively cultivated in Canada and in Europe, especially in Scotland. A kind of liquor (*liqueur de cassis*) is made in large quantities from them in France. The raw fruit has an unpleasant odor and flavor, which becomes agreeable only by scalding. It possesses medicinal properties and is used as a tonic and in throat troubles.

Ribes Americanum, the Western representative of the black currant, possesses all its good qualities and is more ornamental. Another American species very generally met with in ornamental plantations, under the name of flowering currant, or golden currant, is *Ribes aureum*. It has been lately placed upon the market as a fruit plant under the name of Crandall currant; its fruit is of good quality, but it is a small bearer. The red-flowered currant (*Ribes sanguineum*), now so common as an ornamental bush in shrubberies, and trained on walls, producing in April a profusion of deep-red flowers in large drooping racemes, is a native of northwestern America, and was introduced into Great Britain in 1826. Its bluish-black, mucilaginous, insipid berries are not poisonous, as is popularly believed. Another currant, with beautiful red berries, larger than the largest English red currant, occurs on the Himalayas, at an elevation of 13,000 feet. The name native currant, or Australian currant, is given in Australia to the berries of different shrubs, particularly the white berries of *Leucopogon Richei*, of the natural order Epacridaceæ. Other fruits bearing the same name are produced by species of *Coprosma* (natural order Cinchonaceæ), but they are very inferior.

Currant Discases.—Two diseases of the currant are well known in the United States, and they both occur in Europe and elsewhere. The anthracnose, caused by *Gleosporium ribis*, attacks the leaves, causing small black spots on the upper side, and later white areas on the under surface; the leaves turn yellow and fall from the bushes. The leaf-spot, due to *Septoria ribis*, occurs as whitish spots with black centres, which spread over the leaf, causing it to fall prematurely, the whole bush being bare by late summer. These diseases can be prevented by the proper use of any standard fungicide (q.v.).

CURRANT-INSECTS. Currants are most injured by the caterpillar-like larvæ, called 'currant-worms,' of two sawflies (q.v.). One, of foreign origin, is *Nematus ribesii*, and the other, a native, is *Pristiphora grossulariæ*. Both are fully described and treated of by Professor Riley in his *Ninth Report on the Insects of Missouri*, and hellebore is recommended as a remedy. These defoliate the plant. Its stem and roots are attacked by scale-insects and by two borers of note. One is the caterpillar of a small wasp-like ageriid moth or clearwing (*Egeria tipuliformis*): the other is a small, black, sparsely spotted, long-horned beetle (*Pscnocercus supernotatus*). It lays its eggs on the currant-stems

early in June, where there are soon hatched tiny grubs that begin to bore into the stem until they reach and feed upon the pith. When full grown (before the close of the season) they are half an inch long, have brown heads, and whitish, pubescent bodies. When about to change to a chrysalis, this larva gnaws a tunnel to, but not quite through, the outer bark, and then pupates in this chamber, and sleeps through the winter. As soon as it is revived by the spring it makes its final change, and the beetle gnaws its way out. The way to destroy these beetles is to prune and burn all dead twigs on the bushes early in spring. Compare GOOSEBERRY.

CURRENT WINE. A wine made of the juice of red or white currants, to which is added water and a little spirits before it is set aside to ferment. Fermentation requires several weeks, and the wine is not fit for use for at least some months afterwards. Black currant wine is made in the same way from black currants.

CURRENCY (ML. *currentia*, current of a stream, from Lat. *currere*, to run). The circulating medium in which debts are paid and the business of the country transacted. This would seem to be also the definition of the term money, and, indeed, among economic writers there is no hard and fast line to distinguish the use of the respective terms currency and money. In general, however, the term currency applies more specifically to those attributes of money which are included under the designation medium of exchange, as distinguished from those which attach to its function as a standard of value.

While, with few exceptions, the money of civilized States rests upon a metallic basis of gold and silver, the circulating medium is often exceedingly complex. Of this the statement of money in circulation in the United States furnishes an excellent illustration:

MONEY IN CIRCULATION IN THE UNITED STATES SEPTEMBER 1, 1901

Gold coin.....	\$630,037,710
Gold certificates.....	259,342,649
Standard silver dollars.....	68,021,039
Silver certificates.....	433,550,842
Subsidiary silver.....	80,788,228
Treasury notes of 1890.....	44,300,417
United States notes.....	333,975,624
Currency Certificates Act of June 8, 1872.....	347,773,315
National Bank notes.....	347,773,315
Total.....	\$2,197,789,824

The aggregate of these various forms of money constitutes the currency of the nation; but among them we can recognize one only—namely, gold coin—as possessing all the attributes of money. It is in the relation of these other forms to the standard money that the questions touching the currency arise. While a fuller discussion of these questions must be reserved for other articles, a brief survey can be had in examining the list here given. In it we recognize three types—token currency, Government paper currency, and bank currency.

The subsidiary silver and minor coinage of the United States (the latter not given in the table) represent in the fullest sense token currency. The metallic value of the coins is in contemplation of the law less than their nominal value; their legal-tender quality is limited, as is also their amount, while the Government undertakes the obligation to redeem them in stan-

dard money. The silver dollars approach token currency in the lack of correspondence between their metallic and nominal values and in the limitation of their quantity, but they depart from its principles in possessing full legal tender and in not being directly redeemable in gold.

Two forms of paper currency appear in the circulation of the United States—the certificates and the legal-tender notes. The certificates, whether of gold, silver, or currency, represent in another form a definite quantity of money deposited in the United States Treasury. They are not themselves endowed with the legal-tender qualities of the money they represent, though receivable by the Government as money. The United States notes convertible into gold on demand are secured not by an exactly equivalent holding of gold by the Treasury, but by a 'reserve' of \$150,000,000, which is deemed sufficient to meet all ordinary demands for redemption. Experience has taught that all such obligations due on demand will not be presented simultaneously. The Treasury notes of 1890, popularly known as 'Sherman notes,' were issued in payment for silver bullion bought between 1890 and 1893. They are full legal tender and are redeemable in gold like the United States notes. They are gradually being retired in exchange for silver certificates based on silver dollars coined from the bullion purchased by the notes when first issued.

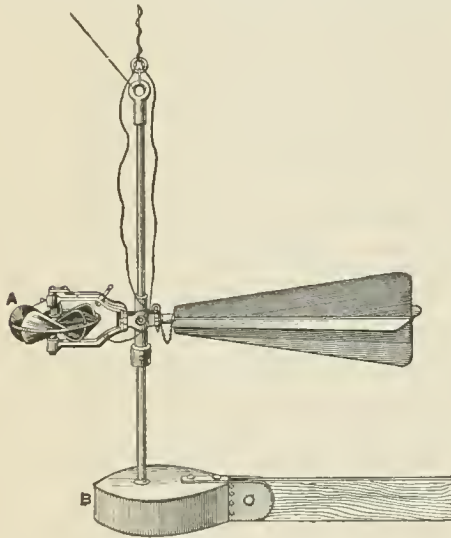
Banking currency is represented in our circulation by the national-bank notes. These are receivable at par by all national banks and by the Government in payment of all dues except customs duties, and are payable for all debts owing by the United States except interest on the public debt and in redemption of United States or Treasury notes, for they rest, not on the credit of the issuing banks, but on Government bonds, and their redemption is guaranteed by the Government. Viewed in this light they appear as a form of Government paper currency.

The word currency is often used to include such credit instruments as checks and drafts, and is usually then designated 'deposit currency.' Consult: Farrer, *Studies in the Currency* (London, 1898); *Sound Currency Red Book*, published by Reform Club (New York, 1896); Horace White, *Money and Banking* (New York, 1902). See BANKS; COINAGE; GREENBACKS; TREASURY NOTES; MONEY.

CURRENT, ELECTRIC. See ELECTRICITY.

CURRENT-METER. A device for measuring the velocity of sub-surface currents, usually for the purpose of ascertaining the discharge of a stream or channel. (See HYDROGRAPHY.) Current-meters are made in several patterns, but they are all of the same general form. A horizontal metal frame or body carries at one end a vane-like tail, and at the other end a bladed wheel free to rotate, the whole being attached at its centre of gravity to a vertical metal shaft so as to have a free, rocking motion between certain limits in the vertical plane. When sunk in flowing water by attaching a suspending wire or cord to the top of the shaft and an anchor weight to the bottom, so as to hold the shaft vertical and the meter-frame horizontal, the current acting on the vane-like tail, like the wind on a weatherecock, swings the instrument into coincidence with the direction of the cur-

rent, with the bladed wheel pointing against the current. The current, striking the blades of the wheel, causes the wheel to rotate at a speed varying with the velocity of the current, and a record of the speed of rotation is kept by means of an electrical circuit which is completed and broken by the wheel one or more times each revolution. The recording apparatus is kept on shore or in a boat, while the meter is suspended by suitable appliances at any point of the stream at which it is desired to measure the velocity of the current. With one exception, which is noticed further on, the chief difference between the different patterns of current-meter now in use exists in the rotating wheel. In the earliest form of meter, invented by Gen. Theodore G. Ellis, the wheel has helicoidal blades, but in later forms conical cup-shaped vanes are employed. The invention of the electrical recording attachment as applied to current-meters is credited to D. Ferrand Henry, of Detroit, Mich. The Price current-meter shown in the



PRICE CURRENT-METER.

illustration has an electrical recording device, and the wheels shown at A are of such shape that they feel the influence of a very slight current. The weight which serves to keep the apparatus submerged is shown at B. The most recent pattern of current-meter is the so-called direction current-meter invented by E. S. Ritchie and E. E. Haskell, the latter of the United States Coast and Geodetic Survey. With this meter the observer is able to determine simultaneously on recording dials the direction and velocity of any current. This meter consists of a fish-like body, or chamber, mounted on horizontal bearings carried by a ring which encircles the body. To the top of this ring is attached an eye for the suspension-cable connection, and to the bottom is attached a similar eye from which the anchor weight is hung. The rear end of the body is prolonged in the shape of a tail-vane, cruciform in section, and the forward end terminates in a hollow shaft on to the end of which the wheel-hub is journaled. The wheel is of the screw-propeller type and conical in form, and its rotation is recorded by indica-

tors operated by an electrical circuit. The body of the meter is a compass, whose needle is free to assume the magnetic meridian, and by means of an electric circuit the angle between the direction in which the compass-needle points and the direction in which the axis of the instrument points is recorded on a dial. This meter is sufficiently delicate to record a variation in velocity of current as small as 0.2 foot per second.

CURRENT RIVER. A stream less than 250 miles in length, rising among the foothills on the eastern slope of the Ozark Mountains, in Texas County, southern Missouri. It flows southeast, then south, crossing into Arkansas, where it joins the Black River in Randolph County (Map: Arkansas, E I).

CURRENTS. See OCEAN CURRENTS; TIDES.

CURRICULUM (Lat. *curriculum*, a running, a course, from *currere*, to run). The term applied to a course of study, or collectively to that of any type of educational institutions, as the college curriculum, the high-school curriculum, the common-school curriculum, etc. The historical basis of the modern educational curriculum is found in the Seven Liberal Arts of the Middle Ages, the development of which from Greek philosophical speculation and educational practices is traced under the title of ARTS, SEVEN LIBERAL. As long as the idea of the symbolical perfection of this organization of studies and of human knowledge prevailed, there was no modification of the form of the curriculum, though the content of these terms was modified from time to time. All lower education was included in the subject of the *trivium*—i.e. grammar, rhetoric, and dialectic—which represented so many approaches to the Latin language. This was based, it is true, on the work of the 'singing' school, which furnished to the child the school arts (reading and writing), with a modicum of arithmetic. The curriculum of higher education included the subjects of the *quadrivium*—i.e. arithmetic, geometry (mathematics) and geography), astronomy (natural sciences), and music (aesthetic, etc.). The elaboration of the curriculum under the influences of the early universities and of the Renaissance consisted chiefly in the addition of the subjects of medicine and law, both common and civil, and in the change in the content of the subjects of the quadrivium. These changes can be followed in the successive Papal rules and university regulations which prescribed the books that should be read in the several subjects. From the time of the Renaissance to the close of the eighteenth century, there was no modification in the organization of the educational curriculum and little in the content. From that time, however, the changes have been numerous and radical, and the old idea of the historical and logical perfection of the traditional curriculum has largely disappeared. In the United States, where conditions permitted these changes with less opposition than in the more conservative societies, very extensive changes have occurred, and an almost chaotic condition has ensued. These changes have consisted primarily in the addition of new subjects to each of the stages of the curriculum, due to the great development of knowledge, especially scientific, during the nineteenth century. The curriculum of the elementary school has expanded in content

from the three fundamental school arts until it now embraces from twelve to fifteen subjects in half that many spheres of intellectual interests, and in time, from three or four years to eight and nine; the secondary curriculum has undergone no expansion in time, perhaps a diminution, owing to the encroachment of both the lower and the higher curricula, but has added so great a number of subjects that it deals in a preliminary way with almost all those included within the curriculum of college and university. This multiplication of subjects, with no corresponding increase in time and with but little improvement in methods of teaching, has made the problem of the curriculum of the secondary school peculiarly difficult, and that part of our educational system is most in need of reform.

The problem of the curriculum in each of its stages is twofold: that of content, and that of organization. This twofold problem is now and long has been the chief topic of educational discussions in the United States. It cannot be said that any solution has been offered, but a statement of the case will be found in the article **PEDAGOGY**. (See also **ELECTIVE STUDIES**.) The matter has received extended study by American educators, and has formed the subject of two important reports by committees appointed by the National Educational Association. The first of these, issued in 1892, is known as the *Report of the Committee of Ten*, and relates chiefly to secondary education; the second, known as the *Report of the Committee of Fifteen*, relates chiefly to the elementary school and was issued in 1895. Consult, also: *Reports of the National Educational Association* (Washington, 1865, et seq.); files of the *Educational Review* (New York, 1891, et seq.).

CUR'RIE, JAMES (1756-1805). A Scottish physician. He was born at Kirkpatrick Fleming, Dumfriesshire; held a mercantile position at Cabin Point, Va., from 1771 to 1776; and graduated at Glasgow University in 1780. He settled in Liverpool, where he obtained a considerable practice as a physician, and published *Reports on the Effects of Water in Fever and Febrile Diseases* (1797). He is best known, perhaps, for his (the first) edition of *Burns* (1800; 7th ed. 1813), prefaced by a *Life* which was long the basis for studies of the poet.

CUR'RY, JABEZ LAMAR MONROE (1825-1903). An American lawyer, educator, and clergyman. He was born in Lincoln County, Ga., but removed to Alabama in 1838, where he was admitted to the bar in 1845. He served in the Alabama Legislature from 1847 to 1855, and in Congress from 1857 to 1861, and then became a member of the Confederate Congress. After the war he became a Baptist minister, was president of Howard College, Ala., from 1866 to 1868, and was professor of law at Richmond College from 1868 to 1881. From 1881 to 1885 he was general agent of the Peabody Educational Fund, from 1885 to 1888 was United States Minister to Spain, and subsequently was chairman of the educational committee of the John F. Slater Fund. His publications include: *Constitutional Government in Spain*; *William Ewart Gladstone* (1891); *The Southern States of the American Union* (1894); *Establishment and Disestablishment in the United States*; and *History of the Peabody Educational Fund*.

CURRY POWDER, and CURRY PASTE (Kannarese *kari, kadi*, Malayalam *kari, curry*). A compound condiment added to cooked dishes of meat and rice to render them piquant and appetizing. So generally is curry powder employed in East Indian cookery that it has been called the 'salt of the Orient.' Substances that commonly form the basis of these powders are turmeric, fenugreek, and sago. To these ginger, black and Cayenne pepper, coriander, caraway, and many other spices are added in varying quantities or omitted, according to the locality. Such curry powders as contain the pulverized leaves of *Murraya Koenigia*, an East Indian tree of the natural order Rutaceæ, are used not only as aromatic stomachic stimulants, but as remedies for dyspepsia, diarrhœa, and even dysentery. The basis of many curry pastes is tamarind (q.v.).

CURSCHMANN, kōōrsh'mān, HEINRICH (1846—). A German physician, born at Gies-sen. He studied at the university there, became a lecturer at the University of Berlin in 1875, and in 1876 was appointed head physician of the hospital connected with the city barracks of Berlin. In 1879 he obtained the post of director of the general hospital at Hamburg, and in 1888 was called to the chair of special pathology and therapy in the University of Leipzig. He became recognized as a prominent authority on hospital administration, and from 1886 to 1892 was an associate editor of the *Fortschritte der Medizin*. His publications include: *Entwicklung der Krankenpflege und des klinischen Unterrichts* (1889); *Klinische Abbildungen* (1894).

CURSE OF KEHAMA, kō-hā'mā, THE. A poem by Robert Southey (1810), relating to the adventures of an Indian rajah who is cursed with supernatural powers.

CURSE OF SCOTLAND, THE. In cards, a term applied to the nine of diamonds. Its origin is unknown. Among the many explanations offered are the following: (1) The nine of diamonds is the 'pope' in the game of Pope Joan, and hence the symbol of Antichrist to the Reformers. (2) It is the chief card in comette, which game ruined many families in Scotland. (3) It goes back to the nine lozenges on the Dalrymple arms, the Earl of Stair having been responsible for the massacre of Glencoe.

CURSIVE WRITING. See **PALEOGRAPHY**.

CUR'SOR MUN'DI (Lat., courier of the world, but intended to mean the course of the world, *cursus mundi*). A poem dating from the beginning of the fourteenth century, professing to be a history of the world from its creation to its destruction. It was based on the paraphrase of Genesis by Cadmon. It is among the works printed by the Early English Text Society.

CURTAIN. A term used in fortification. See **BASTION**; **FORTIFICATION**.

CURTAIN, THE. An old theatre in London at Shoreditch, called also the Greene Curtain, mentioned in 1577 and probably established about that year. The name was probably given from its green curtain, used for the first time in this theatre. After the time of Charles I. it was turned into an arena for the prize-fight.

CURTAL FRIAR. A term used by Sir Walter Scott in *Ivanhoe*, to denote an irregular clerk or 'hedge-priest,' and applied by him to Friar Tuck of Copmanhurst. The phrase seems to denote a monk with his gown or frock shortened (curtailed) for convenience of moving about. Consult: *Ivanhoe*, chap. xxxii., and "Robin Hood and the Curtall Friar," in Child's *Ballads*, v. 273.

CURTANA (Neo-Lat., from Lat. *curtus*, short). (1) The name given to the sword of Ogier the Dane. (2) The sword of Roland, the point of which had been broken off in trying it. (3) A pointless sword, also known as 'the sword of Edward the Confessor,' carried before English kings at coronation and symbolizing mercy.

CURTESY (OF. *curteisie*, *cortoisie*, Fr. *courtoisie*, courtesy, from OF. *curteis*, *cortois*, Fr. *courtois*, courteous, from ML. *cortis*, court, from Lat. *cors*, *cohors*, place inclosed: connected with Gk. *χόρτος*, *chorotos*, garden, OIr. *gort*, sedge, Goth. *gards*, Icel. *garpr*, house, OHG. *gart*, circle, Ger. *Garten*, AS. *gard*, Engl. *yard*). In law, the life interest which the surviving husband has in the real or heritable estate of the wife. It is remarkable that, both in England and Scotland, this customary right should be regarded as a national peculiarity—that in England it should be called the curtesy of England, and in Scotland the curtesy of Scotland—whereas it is well known to be peculiar to neither of them. Traces of it are to be found in a constitution of the Emperor Constantine (code 6. 60. 1): and there can be no doubt that it had found a place, with all the peculiarities which now belong to it, in the *coutume* of Normandy, whence there is every reason to think that it was transferred to England (Barnage, vol. ii., p. 60; Stephen's *Commentary*, vol. i., p. 264; Fraser's *Domestic Relations*, vol. i., p. 635). The four circumstances which are requisite to make a tenancy by curtesy in England are lawful marriage, actual seizin of the wife, birth of living issue, and the wife's death. It is not necessary, however, that the child survive; it is enough that it was once in existence, although it may have died immediately after its birth. Not only must the estate of the wife be one of inheritance, i.e. a fee simple or a fee tail, in order that the husband shall be entitled to curtesy therein, but the child born must have been one capable of inheriting the estate in question. Thus if the estate were entailed on male issue, and a daughter were born, the husband's inchoate estate of curtesy would not become vested, or 'initiate,' as the phrase was. Accordingly it is said that curtesy is due to the surviving husband rather as the father of an heir than as the widower of an heiress. As soon as the estate becomes vested in the husband by the birth of appropriate issue, he may alienate his life interest in it, subject of course to the wife's rights therein during her life. If she die first the estate, notwithstanding the conveyance, is defeated. Originally curtesy attached, as dower still does in the United States, to all estates of inheritance of which the wife was seized at any time during the marriage. But it is now limited, both in this country and in England, to such lands as she is seized of at her death: and she may, by alienating the land during her lifetime or by last will and testament, defeat her husband's claims as tenant by the curtesy. See

Blackstone, *Commentaries on the Laws of England*; Pollock and Maitland, *History of English Law* (Boston, 1899).

CURTILAGE (OF. *cortillage*, *curtillage*, *curtilage*, *courtillage*, from *cortuil*, *cortil*, *curtil*, courtyard, from Lat. *cors*, *cohors*, inclosed place). The inclosed space of ground and buildings immediately surrounding or lying near a dwelling and used for its convenient occupation. The term is of feudal origin and originally meant a castle and outbuildings inclosed in a stone wall for defense. There is no exact limit to the area which may be included under the term, and it is a matter of proof in each case as to what is set apart for the use of any particular dwelling. The law has always given the curtilage greater protection than outside property, and this idea prevails to-day, as in most jurisdictions breaking and entering curtilage is burglary, and setting fire to any building in it constitutes arson. See REAL PROPERTY, and consult the authorities there referred to.

CURTIN, ANDREW GREGG (1817-94). An American politician, famous as the 'war Governor' of Pennsylvania. He was born in Bellefonte, Pa., studied law in Dickinson College, was admitted to the bar in 1839, and soon became prominent, as a Republican, in State politics. He was appointed Secretary of State for Pennsylvania in 1854, and from 1860 to 1866 served as Governor of the State. From 1869 to 1872 he was Minister to Russia, and after his return abandoned the Republican Party and served as a Democratic member of Congress from 1881 to 1887. During the Civil War he was always prompt in his response to President Lincoln's calls for troops, and by his minute care for the persons and families of the Pennsylvania soldiers, won their esteem and became widely known as 'the soldier's friend.'

CURTIN, JEREMIAH (1840—). An American linguist and translator, born in Milwaukee, Wis. He prepared for Harvard and by his own efforts graduated there in 1863, as an excellent linguist. In the following year he went to Russia, where he remained until 1870 as secretary of legation for the United States at Saint Petersburg. While serving in this capacity he made a careful study of the languages of the Slavic group, and it was the knowledge thus acquired which has enabled him to make his translations of works by Sienkiewicz, Zagoskin, and Alexis Tolstoy. From 1883 to 1891 he was connected with the Bureau of Ethnology of the Smithsonian Institution, and since that time has made independent researches in matters pertaining to the North American Indians. Besides his translations, Curtin has written books dealing with folk-lore and mythology, and is said to be more or less familiar with more than sixty languages.

CURTIS, BENJAMIN ROBBINS (1809-74). An American jurist, born in Watertown, Mass. He graduated at Harvard in 1829, was admitted to the Massachusetts bar in 1832, and soon became one of the foremost lawyers of the State. In 1851 he was appointed by President Fillmore to the United States Supreme Court, and in 1857 he dissented, in a powerful argument, from the opinion of the majority in the Dred Scott decision (q.v.). In the same year he resigned and resumed his practice in Boston. During the

celebrated impeachment trial of 1868 he was one of President Johnson's counsel. He published several valuable collections of law reports, including *Reports of Cases in the Circuit Courts of the United States* (2 vols., 1854); *Decisions of the Supreme Court of the United States* (22 vols.); and *Digest of the Opinions of the Supreme Court of the United States to 1854*. Consult *Memoirs and Writings of Benjamin R. Curtis* (Boston, 1880), the first volume of which is a memoir by his brother, George Ticknor Curtis. (q.v.).

CURTIS, GEORGE TICKNOR (1812-94). A distinguished American jurist and writer on the constitutional history of the United States. He was born in Watertown, Mass.; graduated at Harvard in 1832; was admitted to the bar in 1836, and began the practice of the law in Worcester, Mass. In the following year he removed to Boston, where he continued with short intermissions to practice law until 1862, from which time until his death he practiced in New York City and before the United States Supreme Court in Washington, D. C. While in Boston he acted for many years as United States Commissioner, and in this capacity, though his sympathies were strongly against the institution of slavery and the rendition of the fugitive slaves, he ordered the return of Thomas Sims (q.v.) to his master in accordance with the Fugitive Slave Law in 1852, and for so acting was denounced by the Abolitionists throughout the country. Among the well-known cases in which he appeared as counsel are the Dred Scott case, the legal-tender cases, the Colt revolver suits, and the sewing-machine cases. He was popular as a public speaker and delivered many able addresses dealing for the most part with legal or political subjects. He will best be remembered as a writer, and especially as the author of the valuable *Constitutional History of the United States from their Declaration of Independence to the Close of their Civil War* (1896), a part of which was first published in 1854 as *The History of the Origin, Formation, and Adoption of the Constitution of the United States*; and of the *Life of Daniel Webster* (1870), and the *Life of James Buchanan* (1883). He also published, besides numerous magazine articles: *Digest of the English and American Admiralty Decisions* (1839); *Rights and Duties of Merchant Seamen* (1841); *American Conveyancer* (1846); *Law of Patents* (1849); *Equity Precedents* (1850); *Commentaries on the Jurisprudence, Practice, and Peculiar Jurisdiction of the Courts of the United States* (1854-58); *Memoir of Benjamin R. Curtis* (1880); *Creation or Evolution: A Philosophical Inquiry* (1887); and a novel entitled, *John Chambers: A Tale of the Civil War in America* (1889).

CURTIS, GEORGE WILLIAM (1824-92). An American critic, essayist, and publicist, born in Providence, R. I., February 24, 1824. After a few years at school he began life as a clerk, in New York, joined the Brook Farm Community at West Roxbury, Mass., in 1842, went thence, after eighteen months, to Concord, Mass., and afterwards spent some years in Italy, Germany, and the Orient. Returning to America in 1850, he became well known through his books of travel and his editorship of *Putnam's Monthly*. In *Harper's Monthly* he published a series of

papers called *The Editor's Easy Chair*, from 1853 onward, which increased his reputation. He was popular also as an anti-slavery orator and lecturer, was long the chief editor of *Harper's Weekly*, took an active part as Republican (till 1884) in politics, and after 1871 in the agitation for civil-service reform. He declined offers of diplomatic service abroad. Shortly before his death, which occurred at West Brighton, S. I., August 31, 1892, he became chancellor of the University of New York. He was the master of an attractive style, and his books of travel and light essays paved the way for the more important services rendered by his polished lectures and orations and by his single-hearted, patriotic labors in behalf of a pure civil service. His strictly literary reputation seems hardly so well assured as it did a few years since, but the man and orator are still remembered with pleasure and gratitude. His youthful years spent at Brook Farm are charmingly set forth in his letters exchanged with John S. Dwight, which have been published in a volume (1898). His most important publications are: *Nile Notes of a Howadji* (1851); *The Howadji in Syria* (1852); *Lotus Eating* (1852); *The Potiphar Papers* (1853), a satire on New York social life; *Prue and I* (1856), generally thought the best of his early books; *Trumps: A Novel* (1861); *Eulogy on Wendell Phillips* (1881); three series of essays from the "Easy Chair" (1892, 1893, 1894, etc.). He edited the *Correspondence of Motley* in 1889 (2 vols.). Charles Eliot Norton edited his *Orations and Addresses* in 1893-94 (3 vols.). Edward Cary wrote his biography for the "American Men of Letters Series" (Boston, 1894).

CURTIS, SAMUEL RYAN (1807-66). An American soldier. He was born near Champlain, N. Y., but when very young removed to Ohio. In 1831 he graduated at West Point, and in the following year resigned from the service to become a civil engineer. He afterwards studied law, was admitted to the bar, and practiced from 1843 to 1845. In the Mexican War he served as a colonel of volunteers, and from 1847 to 1848 was Governor of Saltillo. He was then successively an engineer and a lawyer in the West, and for two terms and a part of the third was a member of Congress from Iowa. He became a brigadier-general of volunteers in 1861, commanded the southwestern district of Missouri from December, 1861, to February, 1862, and the Army of the Southwest from February to August, 1862, and on March 7-8, 1862, defeated the Confederate general Van Dorn, in the battle of Pea Ridge (q.v.). Soon afterwards he was raised to the rank of major-general, and subsequently commanded the departments of Missouri (1862-63), of Kansas (1864-65), and of the Northwest (1865); and in 1865, as United States Commissioner, negotiated treaties with several Indian tribes.

CURTIS, WILLIAM (1746-99). An English botanist, born at Alton, Hampshire. He studied botany, pharmacuties, and entomology, established botanic gardens at Lambeth Marsh and at Brompton, and published a number of valuable works on subjects of natural history. His writings include: *Flora Londinensis* (1777-87; the same work, edited by Graves and Hooker, was republished in 5 volumes in 1817-28); *British Grasses* (1790 and several later editions); and

Lectures on Botany (3 vols., 1805; 2d ed., 1807). In 1781 he established, and for many years thereafter edited, the *Botanical Magazine*.

CURTIS, WILLIAM ELEROY (1850—). An American journalist. He was born in Akron, Ohio, and graduated at Western Reserve University in 1871. From 1872 to 1887 he was on the staff of the *Chicago Inter-Ocean*, and by his great enterprise—notably in securing interviews with the James brothers during their contest with Pinkerton's detectives, and in investigating the Ku-Klux Klans of the South—gained a national reputation. In 1887 he became the Washington correspondent of the *Chicago Record*. He was a commissioner of the United States to the Central and South American republics in 1885, was the executive officer of the International American Conference of 1889-90, and was director of the Bureau of American Republics from 1890 to 1893. He has traveled extensively and is the author of several books, the most important of which are: *The Life of Zachariah Chandler* (1879); *Capitals of South America* (1886); *The Land of the Nihilist* (1887); *The United States and Foreign Powers* (1892; 2d ed. 1899), a concise and generally accurate summary of the foreign relations of the United States; *The Yankees of the East* (1896), an account of the manners and customs of the Japanese; *Between the Andes and the Ocean* (1900); and *The True Thomas Jefferson* (1901).

CURTISS, SAMUEL IVES (1844—). An American Congregational clergyman, born at Union, Conn. He was educated at Amherst College, at Union Theological Seminary, and at the universities of Leipzig and Berlin. From 1874 to 1878 he was pastor of the American Chapel at Leipzig, Germany, and upon his return to America was appointed professor of biblical literature at the Chicago Theological Seminary. He was president of the City Missionary Society of Chicago from 1888 to 1898. In addition to several translations of important works from the German, his writings include: *A Plea for a More Thorough Study of the Semitic Languages in America* (1879); *Moses and Ingersoll* (1881); *Franz Delitzsch; Ezekiel and His Times* (in *The Bible as Literature*, 1876).

CURTIUS, KŌŕ'tsĕ-ŏs, ERNST (1814-96). A distinguished German archaeologist and historian, born at Lübeck. He studied philology at the universities of Bonn, Göttingen, and Berlin, traveled in Greece and Italy, and in 1844 was appointed a professor at Berlin and preceptor of the Crown Prince Frederick William, afterwards Frederick III. From 1856 to 1863 he was professor of classical archaeology and philology at Göttingen, whence he returned to Berlin as professor of ancient history. Since 1853 Curtius was a member of the Royal Academy of Sciences, and from 1871 to 1893 he was continuously secretary of the philologico-historical section of that institution. Under imperial commission in 1874 he negotiated with the Greek Government in regard to the German excavations at Olympia, begun by him in the following year. With Schöne he edited the *Archäologische Zeitung*, in which he published many important contributions. He must be reckoned among the great scholars of modern Germany, a thinker of imperious influence alike in his academic instruction and in his published works. These latter in-

clude: *Peloponnesos* (2 vols., 1851-52), a study of the Greek peninsula with special reference to its mythology, history, and monuments of art; *Griechische Geschichte* (3 vols., 1857-67; 6th ed. 1889), in which he endeavored to present in popular form the results of expert research; *Attische Studien* (1863-64); and three volumes of collected lectures and addresses, entitled *Altertum und Gegenwart*. Consult: Broicher, *Erinnerungen an Ernst Curtius* (Berlin, 1896); also, for a brief but most appreciative study of his personality, Grimm, "Ernst Curtius: Ein Brief an seine Freunde," in the *Deutsche Rundschau*, vol. lxxxviii. (Berlin, 1896).

CURTIUS, GEORG (1820-85). An eminent German comparative philologist. He was the brother of Ernst Curtius, and was born at Lübeck. He studied at the universities of Bonn and Berlin; in 1849 became professor extraordinarius, and in 1851 full professor of philology in Prague. In 1854 he was called to Kiel and in 1862 to Leipzig, where he remained. Curtius was the teacher of many of the most eminent comparative philologists of the present day. His most important works are his *Griechische Schulgrammatik* (1852; many editions since); *Grundzüge der griechischen Etymologie* (5th ed. 1879); *Das Verbum der griechischen Sprache* (2d ed. 1877-80). In his *Studien zur griechischen und lateinischen Grammatik* (1868-78), he published not only his own studies, but those of his pupils and others. In 1878, with Lange, Lipsius, and Ribbeck, he founded the *Leipziger Studien zur klassischen Philologie*.

CURTIUS, Kŭr'shĭ-ŭs, METTUS. In Roman legend, the leader of the Sabines who occupied the Capitoline Hill, in the battle with the Romans of the Palatine, during the reign of Romulus. To escape death he plunged with his horse into a morass, from which he extricated himself with difficulty, and the morass was thenceforth called *Lacus Curtius*.

CURTIUS, QUINTUS (QUINTUS CURTIUS RUFUS). A Roman historian. He was the author of the work *De Rebus Gestis Aleandri Magni*, in ten books, of which the first two have been lost, and the text of the remainder has come down to us in a damaged condition. Great differences of opinion have existed with regard to the time in which Curtius wrote. Some critics have supposed that Curtius lived in the reign of Augustus; others that he wrote in the second century, or under Constantine or Theodosius; but the most probable opinion is that he flourished in the time of Claudius. The value of the work is as dubious as its authorship. Curtius had a very inaccurate knowledge of geography, chronology, military tactics, astronomy, and historic criticism; hence his work is far from being reliable as a whole. The style, though declamatory, is in general pure and elegant. The first edition of Curtius's history was published at Venice about 1471. Modern editions are by Vogel (Leipzig, 1884), and Dossou (Paris, 1887). It is translated into English by Crosby (New York and London, 1858).

CURTIUS, Kŏŕ'tsĕ-ŏs, THEODOR (1857—). A German chemist. He studied at several German universities, and after the publication of a series of original researches, became professor of chemistry at Kiel in 1889; in 1897 he went to

Bonn, but on the death of Victor Meyer, in the same year, accepted the professorship of chemistry at Heidelberg. Curtius discovered new series of important compounds of nitrogen, including hydrazine and many of its derivatives, and the diazo-derivatives of the fatty series of organic compounds.

CURULE CHAIR (translation of Lat. *sella curulis*, from *sella*, seat, from *sedere*, to sit, and *curulis*, curule, from *currus*, chariot, from *currere*, to run). The chair of state, equivalent to a throne, among the early Romans. No one except consuls, praetors, and a few others high in authority was permitted to occupy it. The chair was usually ornamented with gold and other precious work.

CURVATURE. See CURVE.

CURVATURE OF FIELD OF A LENS.

See LIGHT for general discussion of the properties of lenses.

CURVATURE OF THE EARTH'S SURFACE. See CURVE.

CURVE (OF. *courbe*, *corbe*, Fr. *courbe*, Sp., Port., It. *curva*, from Lat. *curvus*, curved, OChurch Slav. *krivŭ*, bent, Lith. *kreivas*, crooked). In common language, a line that constantly departs from a fixed direction. In analytic geometry, however, the word curve is commonly used to designate the locus of a point moving according to any definite law, and hence to include the straight line. If the statement of the law according to which the point moves can be translated into an equation or equations between the coördinates (q.v.) of the moving point, these equations may be used to represent the curve—e.g. the circle is the locus of a point moving in a plane at a constant finite distance from a fixed point in that plane, and its equation is $x^2 + y^2 = r^2$. (See COÖRDINATES.) If the curve possesses the property of continuity (q.v.) it is precisely definable at every point, although it may contain singularities. The form of a curve corresponds to the nature of its equation; hence a curve may be designated as algebraic or transcendental according as its equation consists of algebraic or transcendental functions of the coördinates; for example, the conic sections are algebraic curves, and the cycloid, the logarithmic spiral, and the catenary are transcendental curves. Algebraic curves are fundamentally grouped into orders and classes, according to Newton's classification. The order of a plane curve is determined by the number of points, real or imaginary, in which it intersects any line in its plane. Curves which cut such lines in two points are called curves of the second order; those which cut the lines in three points curves of the third order, and so on—e.g. the conic sections are all curves of the second order, and cubic curves are of the third order. The straight line is the only line of the first order. Similarly the order of an algebraic curve in space depends upon the number of points in which it cuts any plane. The class of an algebraic plane curve is determined by the number of tangents, real or imaginary, which can be drawn to it from any point in its plane. If two tangents are possible it is a curve of the second class, if three are possible, a curve of the third class, and so on—e.g. the conic sections are curves of the second class; the cissoid (q.v.) is of the third class. Similarly the class of a

space curve is given by the number of tangent planes which can be drawn containing any fixed line. The class of a plane curve depends directly upon its order when no singularities exist. If n is the order and c the class, $c = n(n-1)$. Thus a conic with no singular points is of the second class, since $c = 2(2-1) = 2$; the cubic is of the sixth class, since $c = 3(3-1) = 6$. But singularities tend to diminish the class. Plücker gave six equations connecting the order, class, number of double points, number of double tangents, number of stationary points, and number of stationary tangents from which, if any three of these numbers are given, the other three may be obtained. The one directly connecting the order and class is $c = n^2 - n - 2d - 3p$, in which c is the class, n the order, d the number of double points, and p the number of stationary points. Thus, a cubic with one double point is a curve of the fourth class, since $c = 9 - 3 - 2 = 4$. By the aid of covariants (see FORMS), the class of a curve can be determined directly.

SINGULARITIES. (1) An algebraic curve whose equation is $y = f(x)$ is convex or concave downward, according as $\frac{d^2y}{dx^2}$ is positive or negative.

(2) A point of inflection is one at which the tangent to the curve takes a limiting position—that is, the point of contact of a stationary tangent, at which $\frac{d^2y}{dx^2} = 0$ or ∞ . See CURVE OF SINES.

(3) A multiple point is one at which more than one tangent exists—that is, a point for which $\frac{dy}{dx}$ has more than one value. Two values determine a double point, three values a triple point, and so on. A multiple point is also called a node or ernode. Multiple points of the third order are divided into classes according to the relative number of cusps and ernodes involved.

(4) When two branches of a curve have a common tangent at a point, but do not pass through the point, they are said to form a cusp, called also a spinode or stationary point. See CYSOID; COXCHON.

(5) An isolated point whose coördinates satisfy the equation of the curve is called a conjugate point or acnode. An acnode is a multiple point at which the tangents are imaginary. A node or conjugate point corresponds to a double tangent, and a cusp to a stationary tangent.

CURVATURE. The curvature of a plane curve at any point is its tendency to depart from a tangent to the curve at that point. In the circle this deviation is constant, as the curve is perfectly symmetrical round its centre. The curvature of a circle varies, however, inversely as the radius—that is, it diminishes at the same rate as the radius increases. The reciprocal of the radius is therefore taken as the measure of the curvature of a circle. A straight line may be considered a circle of infinite radius and as having no curvature, since $\frac{1}{\infty} = 0$. The constancy

of curvature in the circle suggests an absolute measure of curvature at any point in any other curve, for whatever be the curvature at that point a circle can be found of the same curvature. The radius of this circle is called the radius of curvature for that point; and the

circle itself the osculating circle. By means of this radius we may compare the curvatures at different points of the same curve or of different curves. In simple cases, as in the conic sections, the measure or radius of curvature may be determined geometrically, but it is usually necessary to employ the calculus. The expression for the radius of curvature at any point (x, y) of a curve is

$$\rho = \frac{\left[1 + \left(\frac{dy}{dx} \right)^2 \right]^{\frac{3}{2}}}{d^2y/dx^2}$$

If the curve, instead of lying in a plane, twists in space, it is sometimes called a *gauche curve* or a curve of double curvature, and its curvature at any point may be measured by the radius of its osculating sphere at that point. The centre of the osculating circle or sphere is called the centre of curvature. The curvature of surfaces is determined similarly to that of curves. Thus the measure of the curvature of the earth, commonly taken as the deviation of the line of apparent level from the line of true level—that is, from a line everywhere parallel to the surface of still water—is approximately eight inches per mile.

RELATIONS. The following are some of the more important relations which exist among certain groups of curves:

(1) The evolute (q.v.) of a curve is the locus (q.v.) of its centre of curvature. Regarding the evolute as the principal curve, the original curve is called its involute. The normals to any curve are tangents to its evolute.

(2) Two curves or surfaces are said to have contact when they touch at two or more consecutive points. A contact (q.v.) of the n th order exists between two curves $y_1 = \phi(x), y_2 = \psi(x)$ at the point whose abscissa is a when $\phi(a) = \psi(a), \phi'(a) = \psi'(a), \phi^{(n)}(a) = \psi^{(n)}(a)$. If n is even, the curves cross at the point. No curve which has contact of a lower order can pass between the given curves. Curves which have contact of the first order have a common tangent, and those having contact of the second order have a common radius of curvature at the point of contact.

(3) The envelope of a curve is the locus of the ultimate intersections of the individual curves of the same species, obtained by constantly varying a parameter of the curve. That is, the envelope touches all of the intersecting curves thus obtained; e.g. if p is a variable parameter and $f = 0$ is the equation of the curve, then the result obtained by eliminating p between $f = 0$ and $\frac{df}{dp} = 0$ is the equation of the envelope.

Every curve may be an envelope, and some are evidently so by definition—e.g. evolutes and caustics (qq.v.).

(4) The process of replacing each radius vector of a curve by its reciprocal is called inversion. The origin is called the centre of inversion and the resulting curve the inverse of the given one. See CIRCLE, *Inversion*.

(5) The locus of the feet of the perpendiculars from the origin upon the tangents to a curve is called a pedal curve. The pedal of a pedal is called the second pedal, and so on. Reversing the order, the curves are envelopes and are called negative pedals. The pedal and reciprocal polar are inverse curves. (See CIRCLE.) In general, to find the inverse of a curve whose

equation is given in rectangular coördinates, substitute for $x, y, \frac{k^2x}{x^2 + y^2}, \frac{k^2y}{x^2 + y^2}$ respectively.

(6) A roulette is defined as the locus of a point rigidly connected with a curve which rolls upon a fixed line or curve. See CYCLOID.

CENTRES. A point such that every radius vector (see COÖRDINATES) drawn from it to a point on the curve is matched by another vector of the same length in the opposite direction is called the centre of a curve. See also CIRCLE and the paragraph on *Curvature* above.

When a plane figure moves in any manner in its own plane, the instantaneous centre of rotation is the intersection of two lines drawn through two points perpendicular to the directions in which the points are moving.

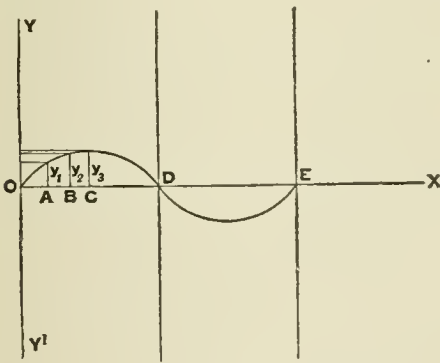
The number of kinds of curves that might be drawn is infinite. A large number are known by specific names, and are objects of great interest on account of their beauty, their remarkable properties, or their relation to physical problems. Among those discussed under separate titles are the conic sections, cissoid, conchoid, lemniscate, cycloid, trochoid, witch, cardioid, cartesianes, Cassinian ovals, caustic curve, tractrix, curve of pursuit, catenary, curves of circular functions (e.g. curves of sines), logarithmic curves, and spirals.

Though the history of curves is inseparable from that of geometry, it may roughly be divided into four periods: (1) The synthetical geometry of the Greeks, in which the conic sections (q.v.) play an important rôle; (2) the birth of analytic geometry, in which the synthetic geometry of Guldin, Desargues, Kepler, and Roberval merged into the coördinate geometry of Descartes and Fermat; (3) the period 1650 to 1800, characterized by the application of the calculus to geometry and including the names of Newton, Leibnitz, the Bernoullis, Clairaut, Maclaurin, Euler, and Lagrange; (4) the nineteenth century, the renaissance of pure geometry, characterized by the descriptive geometry of Monge, the modern synthetic geometry of Poncelet, Steiner, von Staudt, Cremona, and Plücker. Descartes's contributions were confined to plane curves, but led to the discovery of many general properties. The scientific foundations of the theory of plane curves may be ascribed to Euler (1748) and Cramer (1750). Euler distinguished algebraic from transcendental curves, and Cramer founded the theory of singularities. Clairaut (1731) attacked the problem of double curvature; Monge introduced the use of differential equations. Möbius (1852) summed up the classification of the cubic curve, Zeuthen (1874) did the same for the quartics, and Bobillier (1827) first used trilinear coördinates (q.v.). In 1828 Plücker published the first volume of his *Analytisch-geometrische Entwicklungen*, which introduced abridged notation and marked a new era in analytic geometry. To him is due (1833) the general treatment of foci, a complete classification of cubics (1835), and his celebrated 'six equations' (1842). Hesse (1844) gave a complete theory of inflections, and introduced the so-called Hessian curve as the first instance of a covariant of a ternary form. To Chasles (q.v.) is due the method of characteristics developed by Halphen (1875) and Schubert (1879), and the general theory of correspondence (1864),

completed by Cayley (1866) and Brill (1873). Cayley's influence was also very great. He advanced the work of Plücker, investigated bitangents and osculating conics, extended the properties of covariants and invariants, as well as Salmon's theory of reciprocal surfaces and the theory of double curvature. Mention should also be made of the labors of Jean-Claude Bouquet (1819-85) and Charles-Auguste-Albert Briot (1817-82), two of Cauchy's most eminent pupils, whose labors in the field of geometry and theory of functions are well known. Their *Leçons de géométrie analytique* (Paris, 1847) has been translated into English (Chicago, 1896) and forms an excellent introduction to the subject. Besides the works of those mentioned in connection with the development of curves, consult, for the theory: Salmon, *Treatise on the Higher Plane Curves* (Dublin, 1852); Clebsch, *Vorlesungen über Geometrie* (Leipzig, vol. i., 1875-76; vol. ii., 1891); and for history, Merriman and Woodward, *Higher Mathematics*, chap. xi. (New York, 1896); Brocard, *Notes de bibliographie des courbes géométriques* (Bar-le-Duc, 1897-99).

CURVE OF PURSUIT. The problem of the curve of pursuit first attracted attention in the following form: To find the path of a dog which takes the shortest course to reach his master. This problem, though stated in various forms, resolves itself mathematically into finding the curve traced by a point *A* whose movement is always directed toward a point *B* moving on a known curve. The curve seems to have been studied first by Pierre Bouguer (1732). The result is, in general, an algebraic curve; in particular cases logarithmic. For a solution of the problem, consult Salmon, *Treatise on the Higher Plane Curves* (Dublin, 1852).

CURVE OF SINES. A curve whose ordinates are equal or proportional to the sines of a variable angle and whose abscissas are equal to the corresponding arcs of the unit circle. This curve is also called an harmonic curve, it being the curve in which a musical string vibrates when sounded.



CURVE OF SINES.

In the figure, OA represents the length of an arc whose sine is y_1 , OB the length of an arc whose sine is y_2 , and so on. The ordinate y_3 is the sine of 90° , and is the maximum ordinate of the curve. D, which corresponds to an angle of 180° , is a point of inflection, the radius of curvature being infinite. Similarly

the curves of the other trigonometric functions may be represented graphically.

CURVES, ANTICLINAL AND SYNCLINAL. See ANTICLINE and SYNCLINE.

CUR'WEN, JOHN (1816-80). An English music reformer and writer. He was born at Heckmondwike, in Yorkshire, and was early influenced by the community music, in those days characteristic of every Yorkshire village. The influence of Handel, and his oratorios, more than any other single factor, had caused choral and philharmonic societies to spring up throughout the northern counties of England. In order to develop these and the numerous local band organizations, Curwen, then a dissenting minister, resigned his pastorate, and becoming interested in the 'tonic sol-fa' system, invented by Miss S. A. Glover, spent his entire time in propagating it. In 1853 he had begun to found associations for spreading the theory, and in 1862 established the Tonic Sol-Fa College. He was successful enough to start a publishing house in London, where he published the *Tonic Sol-Fa Reporter*. Nearly all of his many publications are for the system of his choice. He died at Heaton Mersey, near Manchester.

CURZOLA, *kor'zò-lá* (Slav. *Korčula*, ancient *Corepra Nigra*, so called from the sombre color of its pine forests). An island of the Adriatic, situated off the coast of the Austrian Crownland of Dalmatia, in latitude 43° N. and longitude 17° E. (Map: Austria, E 5). It is almost 25 miles long, has an area of about 100 square miles, and is hilly, the greatest altitude being 1880 feet. It is well wooded and produces grain, wine, and olives. The inhabitants are engaged chiefly in ship-building, seafaring, and fisheries. It has a number of good harbors. Population, in 1900, 18,749. The principal towns are Curzola, the capital, with a population of 6487, and Blatta, with 7326 inhabitants.

CUR'ZON, GEORGE NATHANIEL, Baron Curzon of Kedleston (1859—). An English statesman, born at Kedleston. He studied at Balliol College, Oxford, became assistant private secretary to the Marquis of Salisbury in 1885, and from 1886 to 1898 sat as a Conservative for the Southport division of Southwest Lancashire. In 1891-92 he was Under-Secretary of State for India, and in 1895-98 Under-Secretary of State for Foreign Affairs. He was appointed, in 1898, Viceroy and Governor-General of India. His administration has proved most acceptable to both the Indian natives and the English Government. His policy aims at the promotion of education, the increased efficiency of the military, and opposition to Russian advance in the East. He has published *Russia in Central Asia* (1889); *Persia and the Persian Question* (1892); and *Problems of the Far East* (1894).

CU'SA, NIKOLAS OF or **NIKOLAUS CUSANUS** (1401-64). A Roman Catholic philosopher and theologian. He was born at Kues, on the Moselle, in the Diocese of Treves; educated at Deventer by the Brethren of the Common Life, and at the University of Padua; became Archdeacon of Liège and attended the Council of Basel (1431-49), where he opposed the Papal claims; but, altering his views, he entered the Papal service and was made a cardinal in 1448; Bishop of Brixen in the Tyrol, and Papal legate for Germany in 1450.

He died at Todi, Italy, August 11, 1464. As a philosopher he was the first to break with the ruling scholasticism. He taught that God passes over into the world, but does not become the world. As a mathematician and natural philosopher he first taught the revolution of the earth about the sun and the plurality of worlds; as critic he declared the so-called 'Donation of Constantine' to be a forgery. His most important writings have been translated into German by F. A. Scharpff (Freiburg, 1862), who also published the first part of a biography (Mainz, 1842), and subsequently *Der Cardinal und Bischof Nikolaus von Cusa* (Tübingen, 1871). Consult, also: Falkenburg, *Grundzüge der Philosophie des Nikolaus von Cusa* (Breslau, 1880); Schanz, *Cardinal Nikolaus von Cusa als Mathematiker* (Rottweil, 1872); id., *Die astronomischen Anschauungen des Nikolaus von Cusa und seine Zeit* (Rottweil, 1873).

CU'SACK, MARY FRANCES (1820-99). An Irish nun, known as the NUN of KENMARE. She was born near Dublin, Ireland, and spent her youth in England, where she joined an Episcopalian sisterhood. She later became a convert to Catholicism and upon her return to Ireland took a deep interest in the Franciscan sisterhoods known as 'Poor Clares,' organized for the purpose of providing poor and friendless girls with a useful education, thus enabling them to become self-supporting. From 1861 to 1884 she conducted the celebrated Convent of Poor Clares, established by her at Kenmare. In the latter year Pope Leo XIII. gave his personal sanction to the founding of the somewhat similar Order known as 'Sisters of Peace,' whose sphere of activity however, was more extensive. After the establishment of a house in Nottingham, England, in 1884, a branch of the Order was successfully founded at Jersey City, N. J. (1885). The movement has had considerable sympathy and support among Irish Catholics both in Europe and in the United States, which country the founder visited in 1886. Among her published works are the following: *A Student's Manual of Irish History* (1870); *Woman's Work in Modern Society* (1874); *The Book of the Blessed Ones*; and lives of Saint Patrick, Saint Bridget, Saint Columba, and Patrick O'Connell. Consult *The Nun of Kenmare: An Autobiography* (Boston, 1888).

CUSACK-SMITH, Sir BERRY (1859—). An English legislator. He was born at Dublin, and was educated at the Middle Temple. After acting for one year as Consul at Samoa and deputy-commissioner for the Western Pacific, he was in 1891 sent as Consul-General to Valparaiso, whence he was again transferred in 1892 to the Tokelau Islands. As special judicial commissioner to Samoa he acted conjointly with the consuls of Germany and the United States as receiver and custodian of the revenues of the islands and as president of the municipality of Apia. He returned to England in 1897, where he was shortly afterwards knighted by Queen Victoria. From June, 1900, to December, 1901, he was chargé d'affaires at Santiago.

CUS'CUS. The native name in the Papuan Archipelago of certain phalangers much esteemed as food. See PHALANGER, and Plate of PHALANGERS AND DASYURES.

CUSCUS. See NETIVER, and Plate.

CUS'CUTA. See DODDER.

CUSH (Heb. *Kūsh*). The eldest son of Ham, according to the genealogical scheme given in the tenth chapter of Genesis. In the Bible, he seems to be regarded as the eponymous ancestor of the Cushites, or people of the land of Cush, a country mentioned in a number of passages of the Old Testament. The Babylonian Nimrod is also said (Gen. x. 8) to have been a son of Cush. The 'Land of Cush' is rendered 'Ethiopia' in the Septuagint, in the Vulgate, and in most modern versions of the Bible, and until comparatively recent times the country has been generally identified with the ancient Ethiopia (i.e. Nubia), called by the Egyptians *Kōsh*, though some scholars have supposed that it also included a portion of Arabia. Some modern critics believe that, in Gen. x., Cush (v. 6) the brother of Mizraim (Egypt) and Cush (v. 8) the father of the Babylonian Nimrod are two different persons, and that the name of the second Cush represents *Kashshu*, an old name for Babylonia. They further maintain that the Arabian Cushites (Gen. x. 7) were also of a different stock, and that thus, under the same name, three different peoples are confused in the biblical account. Other scholars, however, adhering to the older view, believe that the dark Ethiopian race once extended across Arabia into, or even beyond, Babylonia.

CUSHAT, kush'at (AS. *cūscote*, ring-dove, from *cucu*, quick + *scotan*, to shoot; so called from the bird's swift flight), or CUSHIE-DOO (Scotch). A dove.

CUSHING, kush'ing, CALEN (1800-79). An American statesman, the first American Minister Plenipotentiary to China. He was born at Salisbury, Mass., and was educated at Harvard, where he graduated when seventeen years old. He practiced law at Newburyport, and was elected to the State Legislature in 1825 and to the State Senate in 1826. From 1829 to 1831 he traveled in Europe. He was elected to Congress in 1835, and served four terms as a Whig, but afterwards joined the Democratic Party. President Tyler nominated him as Secretary of the Treasury, but the Senate rejected the nomination. Tyler then appointed him Minister to China, where new ports were to be opened according to the Treaty of Nanking. Here he made good use of his erudition and talents. When he arrived, February 24, 1844, at Canton in the frigate *Brandywine*, he had already made the general outline of the treaty, which greatly abridged the subsequent negotiations. The Peking Government honored the United States by sending as High Treaty Commissioner Ki-Ying, a member of the Imperial family, who, on July 3, 1844, signed the convention, which contained sixteen provisions not included either in the English Treaty of Nanking or in the treaty supplementary thereto. Among these was the right of Christian missionaries to follow the openings of commerce and to build dwelling-houses, churches, and hospitals and to have cemeteries, while Chinese scholars acting as teachers or assistants were to be protected from injury. The purchase of books was legalized, and American citizens were forbidden to engage in the opium trade, or to use the flag of the United States to cover a violation of the laws of China. In short, this treaty, because of its

fullness of detail and clear exhibition of the rights conceded by the Chinese Government to foreigners dwelling within its borders, was the leading authority in settling disputes until 1860, when foreigners were admitted to Peking.

After his return to the United States Cushing advocated the Mexican War, and furnished the necessary funds to equip a regiment of which he was made colonel. He subsequently rose to be brigadier-general. In 1852 he became associate justice of the Supreme Court of Massachusetts, and in 1853 entered the Cabinet of President Pierce as Attorney-General, serving through the entire administration. He favored the Union cause during the Civil War. When the arbitration of the 'Alabama Claims' was to be settled at Geneva in 1871, President Grant chose Mr. Cushing as one of the three men who were to be counsel for the United States. In 1873 he was nominated Chief Justice of the United States, but the nomination was withdrawn. From 1874 to 1877 he was Minister of the United States at the Court of Spain. Mr. Cushing was a man of unusual erudition and of rare ability, imposing in person and forcible in argument. He was the author of *The Practical Principles of Political Economy* (1826); *The Growth and Territorial Progress of the United States* (1839); *Reminiscences of Spain* (1833); *Historical Review of the Late Revolution in France* (1833); *The Treaty of Washington* (1873).

CUSHING, FRANK HAMILTON (1857-1900). An American ethnologist. He was born at Northeast, Pa., spent his boyhood on a farm in New York State, and at the age of sixteen began excavations on the sites of Indian camps. He studied for a time at Cornell University in 1875, and in 1876 had charge of a part of the National Museum collection at the Centennial Exposition at Philadelphia. He went to New Mexico in 1879 as assistant ethnologist of the United States Bureau of Ethnology, and remained for three years among the Zuñi Indians. He was adopted into the tribe, made a thorough study of the habits, folk-lore, language, and history of the Pueblo Indians of New Mexico and Arizona, and became the recognized authority in this branch of American ethnology. In 1896 he conducted the Pepper-Hearst Expedition to the Gulf coast of Florida, and published a *Report on the Ancient Key Dwellers of Florida*. Among his publications are: *Zuñi Fetiches* (1881); *The Relationship Between Zuñi Sociology and Mythic Systems* (1882); *The Nation of the Willows* (1882); *Adventures in Zuñi* (1883); and *Studies of Ancient Pueblo Ceramic Art, as Illustrative of Zuñi Culture Growth* (1884). A volume entitled *Zuñi Folk-Tales* was published posthumously in 1902.

CUSHING, HARRY ALONZO (1870—). An American educator, born at Lynn, Mass. He graduated at Amherst College in 1891, studied at Columbia University, and was appointed a lecturer in history and constitutional law at Columbia. In 1895 he became connected with the faculty of political science at that institution. He was also admitted to the bar, and practiced law in New York City. His publications include, besides an edition of *The Writings of Samuel Adams, a History of the Transition from Provincial to Commonwealth Government in Massachusetts* (1896).

CUSHING, LUTHER STEARNS (1803-56). An American lawyer and law reporter, best known as the author of a *Manual of Parliamentary Practice*, or *Cushing's Manual* (1845). He was a native of Massachusetts and was judge of the Court of Common Pleas in Boston and reporter for the Supreme Court of the State, in connection with which he published eight volumes of reports.

CUSHING, THOMAS (1725-88). An American statesman, born in Boston. He was a graduate of Harvard, and president of the General Court, or legislative body of Massachusetts, as well as a member of the Massachusetts Provincial Congress and the First and Second Continental Congresses. In England he had the groundless reputation before the outbreak of the war of being the great leader of the American revolutionary movement, and Dr. Johnson, in some of his pamphlets, accused him of aiming at an American crown. At home, however, he made himself unpopular by opposing the Declaration of Independence. In 1788 he was a member of the convention which ratified the Federal Constitution for Massachusetts.

CUSHING, WILLIAM (1732-1810). An American jurist, born at Scituate, Mass. He was appointed Chief Justice of the State Superior Court in 1777; became an associate justice of the United States Supreme Court in 1789, and in 1796 declined the Chief-Justiceship, for which he had been nominated by Washington. He was a founder of the American Academy of Arts and Sciences.

CUSHING, WILLIAM BARKER (1842-74). An American naval officer, born in Delafield, Wis. He studied at the United States Naval Academy from 1857 to 1861, and at the outbreak of the Civil War entered the United States Navy as a volunteer. In 1862 he was promoted to be lieutenant. He soon became conspicuous for his fearless and successful performance of perilous tasks assigned to him, the most notable of which was the destruction by torpedo of the Confederate ram *Albatross*, on the night of October 27, 1864, at her moorings in Plymouth Harbor, N. C. This exploit won him the thanks of Congress and the rank of lieutenant-commander. Later he served in the Pacific and Asiatic squadrons and was commissioned commander in 1872.

CUSHION DANCE. Originally an old country dance in triple time, which was introduced into court at the time of Elizabeth. The dance was very simple; a performer took a cushion and after dancing for a few minutes stopped and sang, "This dance it will no further go;" the musician then sang, "I pray you, good sir, why say you so?" The dancer answered, "Because Joan Sanderson will not come to," and upon the musician's replying, "She must come to, whether she will or no," the dancer threw the cushion before one of the spectators. The one so selected had to kneel on the cushion and allow the dancer to kiss her, after which she repeated the dance.

CUSHMAN, kush'man, CHARLOTTE SAUNDERS (1816-76). A celebrated American actress, best remembered perhaps for her acting of Meg Merrilies in Scott's *Guy Rannering*. She was born in Boston, July 23, 1816, of Puritan descent, and was the eldest of five children left poor with their mother by the early death of their father.

She had, however, a fine contralto voice, which she cultivated, and in 1835 she made her appearance as an opera singer in the *Marriage of Figaro*. Her prospects were bright, when shortly afterwards in New Orleans her voice suddenly failed. She was greatly disheartened, but at the request of a tragedian (Mr. Barton), she undertook her first dramatic part, Lady Macbeth, which became one of her greatest rôles. Long afterwards Lawrence Barrett said of her: "To the last she was the greatest Lady Macbeth of her age." She played for a time in Albany and elsewhere, and then began at the Park Theatre, New York, an engagement which lasted for several years. She took a great variety of parts, both comedy and tragedy, among them Bianca, Helen McGregor, Queen Gertrude, Goneril, Nancy Sikes, her wonderful Meg Merrilies, and later, Queen Katharine, Cardinal Wolsey, Ophelia, Lady Teazle, and many others. In 1844, after a period of successful management in Philadelphia and a tour with Maeready, whom she had supported before, she went to England. She met with great success; while there she and her sister Susan made their first appearance in *Romeo and Juliet*, which had, for that period, an exceptionally long run in London. She returned to America in 1849, but revisited Europe several times. In 1856 she went to Rome, where she had a home for some years. She was honored in the most cultivated society of Europe and America, not only as a great artist, but as a good woman. During the Civil War she showed her patriotic spirit by giving performances for the benefit of the Sanitary Commission, contributing in this way over \$8000. In her later years she was known as a reader, with singular interpretative powers. Her last appearance on the New York stage, November 7, 1874, was a memorable occasion. She played Lady Macbeth. When the curtain fell, a body of eminent citizens, with William Cullen Bryant as spokesman, came upon the stage and presented the actress with a laurel crown, inscribed *C. C.—Palmar qui meruit ferat*. Charlotte Cushman never married. She died in Boston, February 18, 1876. In 1880 her grave in Mount Auburn was marked by an obelisk which in form is a copy of Cleopatra's Needle as it stood in Heliopolis. Consult: Stebbins, *Charlotte Cushman: Her Letters and Memories of Her Life* (Boston, 1878); Clement, *Charlotte Cushman* (Boston, 1882); and Cook, *Hours with the Players* (London, 1881).

CUSHMAN, ROBERT (c.1580-1625). One of the founders of the colony at Plymouth, Mass. He was born in Kent, and arranged the emigration of the Pilgrims to Holland, later following them to Leyden. He accompanied Deacon Carver upon his fruitless mission to London (1617); assisted Brewster in obtaining a patent from the King (1619); and, together with Carver, chartered the *Mayflower*. He emigrated to New England with his son Thomas in 1621, and leaving him there in the care of Governor Bradford, returned to Europe three weeks later to act as the agent of the colonists in London. The celebrated sermon on "Sin and the Danger of Self-Love," delivered by him before his departure, is memorable as being the first published discourse delivered at Plymouth, and is the oldest sermon extant delivered in America. It was printed in London in 1622, and in Boston in 1724 and 1780. The strip of territory on Cape Ann secured by

him and Edward Winslow in 1623 afterwards became the site of the first successful settlement established within the boundaries of the Massachusetts Bay Colony. Sixty facsimile copies of his famous sermon were published in 1870.

CUSINS, kûz'inz, Sir WILLIAM GEORGE (1835-93). An English composer, born in London. He sang in the Royal Chapel at the age of ten. Soon afterwards he was sent to study under Fétis in Brussels, and upon his return obtained the King's scholarship at the Royal Academy of Music. At the age of sixteen he was appointed organist to the Queen's Private Chapel, and in 1867 he succeeded Sterndale Bennett as conductor of the Philharmonic Society, which position he retained until 1883. In 1875 he became examining professor at Queen's College, and in 1876 joint examining professor of scholarships at the National Training School of Music. In recognition of his services in behalf of art, he was knighted in 1892. The few but highly meritorious compositions which he wrote include: *Royal Wedding Serenata* (1863); *Gideon*, an oratorio (Gloucester Festival, 1871); *Masonic Prayers Set to Music*; *Responses to the Commandments* (sung in Queen Victoria's Private Chapel); pianoforte concerto in A minor (performed by Arabella Goddard with success in Rome, Liverpool, New York, and London); *Te Deum*, a cantata; several songs, and a violin concerto.

CU'SIS. The imaginary land of the single-footed race in Mandeville's *Travels*.

CUSK. A fish of the cod family (*Brosmius brosmic*), frequenting rocky ledges in the North Atlantic, especially off the shores of Scandinavia and Newfoundland. It has much the same habits and characteristics as the eod, and is more extensively used in northern Europe than in America, where it has never found favor in market.

CUSP (from Lat. *cuspis*, point, spear). In architecture, the point formed by the meeting of two small arches, or foils, in foil arches (q.v.) or tracery. Cusps often end in rich bosses of flowers and leaves. It is a specialty of the Gothic style, though not unknown, in its simplest form, to Romanesque.

CUSSET, kus'sâ'. The capital of a canton in the Department of Allier, France, at the confluence of the Sichon and Jolan, tributaries of the Allier, two miles northeast of Vichy. It is an ancient town, dating from a convent founded in 886, which was created an abbey in the thirteenth century. It has interesting fifteenth and sixteenth century houses, and the Grosse Tour is a relic of the mediæval fortifications, now replaced by boulevards, which surrounded the town. It is noted for its mineral springs, and has linen, paper, and basket manufactures. Population, in 1901, 6598.

CUST, ROBERT NEEDHAM (1821—). An English Orientalist. He was born at Cockayne, Hatley, Bedfordshire; educated at Eton, and, entering the East Indian service, took honors in the College of Fort William, Calcutta, for skill in four Oriental languages. For many years he served with the military in various parts of India; took part in several battles, and was present at the taking of Lahore in 1846. He also took an active part in the Punjab War of 1848-

49, and in the pacification of the country after the Sepoy Mutiny. After his return from the East, he filled various local offices; became a member of several societies, and is a constant contributor to certain religious publications. Among his works are: *Modern Languages of the East Indies* (1878); *Modern Languages of Africa* (1883); *Modern Languages of Oceania* (1887); *Modern Languages of the Caucasian Group* (1887); *Modern Languages of the Turki Branch of the Ural-Altaic Family* (1889); *Linguistic and Oriental Essays* (5), six series (1880-99).

CUSTARD-APPLE. The name commonly given in the West Indies and other tropical countries to the fruits of certain species of *Anona*, a genus of trees of the natural order Anonaceae. Some of the fruits of this genus are among the most delicious produced in tropical countries, as the cherimoyer (q.v.), and even the common custard-apple (*Anona reticulata*) of the East and West Indies. The custard-apple is a large, dark-brown, roundish fruit, sometimes from its size and appearance called bullock's-heart in the West Indies; the tree is of considerable size. The custard-apple is represented in the northern United States by the common papaw (*Asimina triloba*). There are two or three which are natives of western Africa. To the genus *Anona* also belong the sweet-sop, the sour-sop, the pinana or pinha, all of them tropical American fruits, and the alligator-apple of the West Indies (*Anona palustris*), a fruit which in its present unimproved state is probably not worth cultivation.

CUSTER, GEORGE ARMSTRONG (1839-76). An American soldier, born in New Rumley, Harrison County, Ohio. He graduated at West Point in 1861, was assigned as a second lieutenant to the Fifth United States Cavalry, and arrived at the front on the day of the first battle of Bull Run. He served successively as an aide on the staffs of Generals Phil Kearny, William F. Smith, and McClellan, was promoted to be a captain of volunteers, and served throughout the Peninsular campaign of 1862. In June, 1863 he was made a brigadier-general of volunteers, and was placed in command of a brigade of Michigan volunteer cavalry, which, under his leadership, became one of the most efficient and best-trained bodies of cavalry in the Federal Army. At the head of these troops he distinguished himself at the battle of Gettysburg. His brigade was then attached to Sheridan's cavalry corps, with which he served in the campaigns in Virginia in the spring and summer of 1864, and the subsequent operations in the Shenandoah Valley. Placed in command of the Third Division of Sheridan's corps, he won a victory at Woodstock and distinguished himself at the second battle of Winchester (Cedar Creek). He was brevetted major-general of volunteers on October 19, 1864, for his services, defeated General Early at Waynesboro, and took part in the battles of Five Forks, Dinwiddie Courthouse, and other engagements of Grant's last campaign. After several months' service in Texas during the winter of 1865-66, he applied for leave of absence, in order to accept the offer which had been made him to take command of the cavalry which Juarez was organizing to drive the Emperor Maximilian out of Mexico. His request being denied, he accepted the position of lieutenant-colonel of the Sev-

enth Cavalry. In 1867-68 he gained his first experience as an Indian fighter in Gen. W. S. Hancock's campaign against the Cheyennes, bringing the campaign to a successful conclusion by a decisive defeat of the Indians at Washita, I. T., in November, 1868. From 1871 to 1873 he was stationed with his regiment in Kentucky. In the spring of the latter year he was ordered to Dakota Territory to operate against the Sioux, who, under Sitting Bull and Crazy Horse, had formed a confederacy with other tribes in Dakota and Montana, and had succeeded in organizing one of the most formidable Indian revolts the United States Government had ever had to contend with. During the next three years Custer and his command saw considerable active service in the Black Hills country and along the valley of the Yellowstone. In the spring of 1876 General Sheridan planned a campaign against the Indians which he hoped would be decisive. Three expeditions were set under way, with the expectation that they would meet and act in conjunction against Sitting Bull and his force of about 6000 Indians, who were supposed to be encamped somewhere near the juncture of the Rosebud and the Yellowstone. General Crook, with 2500 troops, was to advance from the east; General Terry, with a force of about the same size, from the south; and General Gibbon, with a smaller force, was to follow the Yellowstone from the west. Custer and his regiment of 600 strong formed part of General Terry's force. On June 17 Crook, feeling his way along the Yellowstone, came upon Crazy Horse and some hundred of his braves on the Rosebud, and engaged them in a sharp but indecisive struggle. Terry and Gibbon had meanwhile effected a junction on the Yellowstone, at the mouth of the Big Horn, without encountering Indians in any number. After their engagement with Crook on the Rosebud, Crazy Horse and Sitting Bull led their forces in a southwesterly direction, until they were directly south of Terry and Gibbon, where they set up their tepees on the west bank of the Little Big Horn. This new move of the Indians was discovered by scouts sent out by Terry, who immediately determined to march upon them. He sent Custer and his cavalry ahead to prevent them from turning to the eastward, and prepared to follow by boat up the Big Horn with all his own troops and Gibbon's, with the understanding that he would meet Custer at the junction of the Big and Little Big Horn on June 26. But Custer, riding night and day, reached the place a day ahead of time. His scouts discovered the Indian encampment on the morning of June 25. Mistaken as to the number of his antagonists, Custer, with his accustomed impetuosity, determined to attack them at once, without waiting for Terry. He divided his troops into three divisions. He kept with himself five companies, with which he planned to attack that part of the village that lay directly before him, dividing the remaining six companies between Major Reno and Captain Benteen, the latter being sent two miles to the southward, while Reno advanced midway between Benteen and Custer. Thus fatally divided, the Seventh Cavalry advanced to the attack of an enemy outnumbering them ten to one. Benteen's advance took him far south of the village. Reno's rather spiritless attack led him against the south end of the village,

where he was repulsed and driven back across the river to the shelter of a protecting bluff. Custer and his five companies dashed almost at the centre of the Indians, were driven back and surrounded, but fought on desperately until every man of them was killed. Not a single man survived to give any account of the tragedy, but their bodies were found the next day when Terry's troops relieved the reunited forces of Benteen and Reno, who had been holding their position on the bluffs with difficulty. Custer was one of the bravest, most daring, and dashing soldiers America has produced, but he undoubtedly allowed his impetuosity to get the better of his judgment. He was the author of *My Life on the Plains* (1874). Consult Whittaker, *Life of General George A. Custer* (New York, 1876). General Custer's wife, ELIZABETH BACON CUSTER, is well known as an author. She accompanied him in many of his campaigns on the frontier, and published: *Boots and Saddles, or Life with General Custer in Dakota* (1885); *Tenting on the Plains* (1887); and *Following the Guidon* (1891).

CUSTINE, *ku'stên'*, ADAM PHILIPPE, Count de (1740-93). A French general, born at Metz. He served with distinction in the Seven Years' War. As colonel of the infantry regiment 'Sain-tonge,' and quartermaster-general of the French Army in America, he took part in the Revolutionary War, and was present at the surrender of Yorktown. In 1792 he became commander of the Army of the Lower Rhine, and conducted the brilliant campaigns against Speyer, Worms, and Mainz. In consequence of his failure, however, in the campaign of 1793, to relieve the latter city, which was recaptured by the Allies, he fell under a strong suspicion of entertaining secret negotiations with the enemy, and was shortly afterwards accused of treason and executed.

CUSTINE, ASTOLPHE LOUIS LÉONARD, Marquis de (1790-1857). A French author, grandson of the preceding, born at Niederwiller, Lorraine. His writings include a play and several romances, but he is mostly celebrated for his descriptions of travels in his *Mémoires et voyages* (1820). The most amusing of his books on travels, *La Russie en 1839* (1843), is very well known.

CUSTIS, GEORGE WASHINGTON PARKE (1781-1857). An American author, the adopted son of George Washington. He was born at Mount Airy, Md., a grandson of Martha Washington, his father being her son by her first husband. Custis studied at Princeton and Saint John's colleges, married Mary Lee Fitzhugh, and in 1802 went to reside on an estate of 1000 acres at Arlington, near Washington. His daughter married Robert E. Lee, the Confederate general. The grand estate was confiscated by the Government and is now the Arlington National Cemetery. Besides orations and plays, he left *Recollections of Washington* (1860).

CUSTOM (OF. *costume*, Fr. *coutume*, It. *costuma*, ML. *custuma*, *costuma*, from Lat. *consuetudo*, habit, from *consuescere*, to grow accustomed, from *consuere*, to be accustomed, from *con-*, together + *suere*, to be accustomed; probably from *suus*, Gk. *ἑός*, *heos*, *ἄς*, *hos*, Skt. *sra*, Av. *hva*, one's own). One of the three great departments of social psychology (q.v.), co-ordinate with language and myth (qq.v.). It

may be defined as "any norm of voluntary action which has been developed in a national or tribal community" (Wundt). Like animal instinct (q.v.), it is the outgrowth of individual habits. But instinct is practically invariable; it expresses the habits of past generations in the form of mechanized, not of consciously motivated, actions, whereas custom, however rigorous its prescriptions, may always be disobeyed or modified; the customary action has not lost its conscious antecedents. Hence we may say that "instinct is habitual conduct that has become mechanical; custom, habitual conduct that has become generic."

The origin of custom appears to have been twofold. In the great majority of cases in which we are able to trace a custom back toward its first beginnings, we come upon religious or ceremonial ideas. In certain other cases custom seems to have originated in ancient rules of law, the meaning of which has been forgotten, while the usage which they enjoin still persists; although, when we consider that every action of importance in a primitive society, whatever its special significance, has a religious aspect, we shall probably not be wrong in referring these legal customs also to an ultimately religious source. As an illustration of legal custom we may cite the Greek and Roman marriage ceremony, in which it was an established tradition that the mothers of the contracting families should bring the bride and groom together—a clear indication of that law of mother-right which the civilized societies of the ancient world had long outgrown. But the mother-right is itself permeated through and through with primitive mythological conceptions: so that we are, in this case, thrown back with practical certainty upon a religious origin of the custom. As an instance of the transformation by custom of the purpose of a religious ceremonial, we may take the funeral feast. In primitive times the 'funeral baked meats' were furnished forth as a sacrificial feast: the mourner seeks in part to obtain the favor of the gods for his dead and in part to offer worship to the dead man himself. Later the feast becomes a meal shared in all piety with the dead; the survivors symbolize their brotherhood with the departed by partaking of the meat which is to sustain him on his pilgrimage to the other world. Nowadays the cake and wine may be offered quite perfunctorily; or may bring so much of comfort to the mourners as springs from the conviction that they have dealt handsomely with the dead; or may serve as an excuse for ill-timed carousals. In any event it has completely lost its primary significance, and has persisted only by virtue of that *vis inertiae* which makes custom at large so valuable a mine of information to the anthropologist and social psychologist.

Consult: Wundt, *Ethics* (London, 1897); id., *Völkerpsychologie* (Leipzig, 1900); Tylor, *Primitive Culture* (New York, 1891); id., *Early History of Mankind* (London, 1878); id., *Anthropology* (New York, 1881). See ANTHROPOLOGY. For the legal aspect of custom, see the following article.

CUSTOM. In a legal sense, a custom is a usage which has obtained the force of law, and which will, accordingly, be enforced by the courts. As is explained in the article on CUSTOMARY LAW, the greater part of the legal

rules enforced by society are the expression of customs, and custom continues to be an important, though diminishing, source of law in civilized as well as in primitive society. Indeed, it is only in the progressive communities, where the constantly accelerating progress multiplies social needs faster than they can be supplied by the slow processes of custom, and where the political consciousness has kept pace with this progress, that conscious legal development by legislation and judicial action tends more and more to supplant the unconscious development of customary law. In the non-progressive societies, which vastly outnumber the progressive, custom is still the principal, if not the only, source of law.

English and American law writers distinguish between *general* and *particular* customs, the former being of general observance and constituting the body of the common law, and the latter being restricted to the inhabitants of a particular district or the members of a certain calling. As an example of the former may be cited the right of the public to use the seashore, between high and low water mark, for landing and other lawful purposes; and, as an example of the latter, the right of persons engaged in the business of towing, on some parts of the river Thames, to go upon the banks of the river for that purpose, though the land is the private property of abutting proprietors. There is, in truth, and from the point of view of jurisprudence, no distinction between the two classes of customs, both depending alike upon immemorial usage, and both, when established, having equally the force of law. In practice, however, the common-law system has made a distinction between them for the purpose of establishing them, the courts taking 'judicial notice' (q.v.) of general customs as a part of the common law which it is their business to interpret and declare, but requiring proof of the existence of local or other particular customs. But the line between the two classes is not very accurately drawn, the custom of the county of Kent, known as 'gavelkind' (q.v.), whereby lands descend to all of the sons equally instead of to the eldest only, and the still more curious custom of 'borough English' (q.v.), under which lands descend to the youngest son in preference to his elder brothers, and which is confined to no particular area, but affects isolated estates or manors in various parts of England, being recognized as parts of the common law, notwithstanding their limited occurrence. Doubtless these exceptional cases are to be explained by the great antiquity of the customs in question and their early recognition by the courts. Of a similar character is the *lex mercatoria*, or custom of merchants, which, though applying only to a limited class in the community, has also become incorporated in the common-law system, and is noticed by the courts without special proof of its terms.

In order that a particular or local usage, alleged to be a custom, shall have the force of law, (1) the practice "must have been used so long that the memory of man runneth not to the contrary"—i.e. as the phrase is understood in England, from the accession of Richard I. (1189); (2) it must have been continued without interruption; (3) it must have been peaceable and acquiesced in, not subject to contention and dispute; (4) it must be definite and certain; (5) it must be reasonable. The ques-

tion of the reasonableness of a custom is often one of great difficulty. It has been decided that any usage relating to land which is destructive of the land itself, or which deprives the owner of the beneficial use of it, is unreasonable. Thus, a custom for all persons to play games or walk for recreation on private property which has not been dedicated by the owner to public use has been held to be unreasonable and void; whereas a custom for all the inhabitants of a village to do the same acts has been decided to be reasonable and protected by law. But a custom for all the inhabitants of a village to pasture cattle on private land is, in its turn, unreasonable. As usually stated, the rule is that a right in the nature of an easement may arise by custom, but not a right in the nature of a profit.

It is doubtful whether local or particular customs can arise generally in the United States. It has usually been assumed that the common-law rules above set forth are in force in this country, and a few States have so held. It has, on the other hand, been decided in New Jersey and Virginia that no rights in another's land can arise by custom, and the decisions have been put upon the ground that there is in the United States no possibility of a usage having the requisite antiquity (i.e. of dating from the reign of Richard I.) to give it the standing of a custom enforceable at law.

The common law makes a further technical distinction between local or particular *custom* and *usage*, the former being of compulsory legal effect, and the latter consisting of current practices, to which parties may or may not conform, and in accordance with which they are supposed to have regulated their conduct or agreements. Thus, in matters of contract, a usage affecting the trade or calling with which the contract has to do may be dealt with as an understood but unexpressed term of the agreement; and in matters of tort, as an allegation of negligence, the usage of the community (as, e.g. the so-called 'rule of the road') may be called into play to determine the presence or absence of negligence. See COMMON LAW; CONTRACT; EASEMENT; LAW; PROFIT. Consult: Blackstone, *Commentaries on the Laws of England*; Holland, *Elements of Jurisprudence* (9th ed., London, 1900); Holmes, *The Common Law* (Boston, 1881); Pollock and Maitland, *History of the English Law* (2d ed., Boston, 1899); Gale, *Treatise on the Law of Easements* (7th ed., London, 1899); Jones, *Treatise on the Construction or Interpretation of Commercial and Trade Contracts* (New York, 1886).

CUSTOMARY FREEHOLD. In English law, a variety of copyhold tenure, sometimes called privileged copyhold, which differs from the common form of that tenure in that it is not expressed to be "at the will of the lord." It is not a true freehold, however, the freehold title being actually vested in the lord of the manor. See COPYHOLD, and the authorities there referred to.

CUSTOMARY LAW. The body of customs recognized as binding in any social group or community, and enforced by its authority. As, in the evolution of humanity, social habits or customs precede the definite organization of social groups, such an organization, when it arises, finds a body of customary observances

ready to be transformed, and in process of being transformed, into positive law. This body of customs constitutes the entire legal system of primitive society, and the development and recognition of new customs and the modification of old customs are its principal, if not its only, means of expansion and change. Indeed, the primitive codes—as the Mosaic law of the Jews, the laws attributed to Lycurgus among the Greeks, the Twelve Tables of Rome, and the more recent barbaric codes (*leges barbarorum*) of the early Middle Ages—represent little more than a statement, in precise and definite form, of the body of custom which had already gained the force of law in the community. It is only when a community has reached the stage of political consciousness that it undertakes deliberately, by legislation or judicial methods, to effect changes in its laws; and even then custom, though relatively diminishing in importance, continues to be an important source of new law.

Customary law, then, is the foundation and basis of all existing legal systems. Of many, if not most, of those systems it constitutes by far the greater portion of the body of rules of which they are composed, and in all of them it forms an important increment of their growth. Even where the political and legal consciousness of a community has reached the stage of sweeping legal reform—as in the Eastern Empire under Justinian and in France under Napoleon Bonaparte—the resultant code of laws, however comprehensive, must be based upon, and must consist mainly of, the rules of the customary law which it is intended to supersede, and its most radical departures from that law are most swiftly corrected by the judicial organs of the community. Undoubtedly the most complete and widespread transformation which the customary law of mankind has ever undergone was the general reception throughout Europe of the civil-law system of Rome. (For the history of this process, see CIVIL LAW.) Only the common-law system of England, upon which that of the United States is based, was able to withstand that influence; and this is still, for the most part, consciously and avowedly a body of customary law. (See CODE; COMMON LAW.) Under the influence of the spirit of nationality, which has so powerfully affected the nations of Europe during the last quarter of the nineteenth century, there has recently developed a strong sentiment in favor of the revival of the local customary law, as against the more general law of foreign origin. This is particularly noticeable in the recent revision of the German codes.

Consult: Maine, *Ancient Law* (11th ed., London, 1887, or any other edition), and *Lectures on the Early History of Institutions* (6th ed., London, 1893); Lee, *Historical Jurisprudence* (New York, 1900); Blackstone, *Commentaries on the Laws of England* (book i. 63-84); Bryce, *Studies in History and Jurisprudence* (New York, 1901); Holmes, *The Common Law* (Boston, 1881); Pollock and Maitland, *History of English Law* (2d ed., Cambridge, Eng., 1899).

CUSTOM HOUSE. The office in a port of entry (seaport or lake port) where masters of ships are bound to enter and clear their vessels according to the statutes governing the subject, and where importers of merchandise must pay customs duties. In the United States the custom house of each port is under the direction of a

Collector of the Port, appointed by the President with the advice and consent of the Senate. He is responsible for its proper conduct, subject only to the direction of the Secretary of the Treasury, and it is his duty to carry out the United States statutes and tariff laws governing and restricting the importation of foreign goods. See CUSTOMS DUTIES.

CUSTOM OF THE COUNTRY, THE. The title of a play by Fletcher and Massinger (about 1628), in part taken from Cervantes. A play by Mrs. Centlivre, with the same title, was produced in 1715.

CUSTOMS DUTIES. Taxes levied upon merchandise which passes a frontier; generally upon goods imported. Such taxes are of very early origin, and in the long conflict between the English King and the Commons over the right of taxation it was claimed that these taxes were ancient customs over which Parliament had no jurisdiction. Hence the name which has since clung to this class of taxes. It appears that in their origin such taxes were largely in the nature of payments for privileges of trading at certain places and for use of the facilities of ports and markets, but that they soon passed beyond the stage of fees into that of imposts. The name customs duties was applied indifferently to the taxes levied at ports of entry or at ports of passage or upon goods brought into a city from surrounding parts of the same country. Such internal customs have almost disappeared in modern countries, though remnants of them are found in the 'octroi' of Paris and other Continental cities. Transit taxes, such as those levied upon the navigation of the Rhine, have also disappeared. Such restrictions upon the freedom of commercial intercourse would no more be tolerated in modern times than the tributes once paid to the Barbary pirates.

Taxes upon exports have become infrequent. They are no longer an element of consequence in the fiscal system of modern States, though a few remnants of them can be found. In South America such taxes are more common. Chile derives considerable revenue from its nitrate exports, and Brazil from its coffee exports. Quite striking, as a return to older forms of taxation supposed to be laid aside, was the imposition in 1901 of a tax of one shilling per ton upon all coal exported from Great Britain.

Customs duties are, therefore, generally synonymous with duties upon imports. Such duties may have no other object than to raise revenue. The most conspicuous case of such a purely fiscal tax is when the imported article is taxed to exactly the same extent as the home product, such a tax aiming to equalize the conditions of competition for the foreign and the home producer. Another distinctly fiscal tax is one imposed upon an article not produced in the home country, as the English duty upon tea. Taxes which weigh more heavily upon the foreign article than the home product, or which are levied upon imports where the same article is not taxed at home, may be purely fiscal in intent or may be designed as a protection for home industries. It is not the magnitude of the taxation which decides this point, but the effect upon the economic order. It is well understood that any taxation whatever influences consumption and production, but this influence may be deliberately planned or in-

cidental. It is the deliberate planning which characterizes a protective tariff. Whether such a course is to be justified is not to be discussed here. (See FREE TRADE; and TARIFF.) It is enough for our purpose to note that the injection into tariff legislation of ulterior economic motives complicates the machinery of customs duties in a high degree. Such a course does not eliminate the fiscal features of a tariff, as there are few States which can afford to handle their customs taxation in such a way as entirely to subordinate fiscal interests to economic policy.

The contrast between a purely revenue tariff and a protective tariff is illustrated most strikingly by comparing the United States and Great Britain. In the latter the general principle is freedom from taxation, duties being laid upon a few articles only, twenty-seven in all. In the United States, the general principle is taxation, and all articles not specifically taxed at rates named, or expressly exempt from taxation, are subject to a duty of 10 per cent. if unmanufactured and of 20 per cent. if manufactured in whole or in part. The complicated structure of the American tariff is shown in the following analysis of the tariff act of 1897, showing the several schedules and the classes of duties imposed by the several paragraphs under each which fix the rates:

convenience of administration has produced a general sentiment in favor of specific duties, but nations which pursue an avowedly protectionist policy cannot yield to this sentiment as largely as those whose tariff is for revenue only. Specific duties can best be applied when the product is comparatively uniform in quality and value. In Great Britain, Germany, and Austria, only specific duties prevail, and the tariffs in France and Italy show very few ad valorem rates.

With these countries the United States stands in marked contrast. Here ad valorem rates are abundant, but the provisions of the act are so complex that a separation of rates into two classes only is not practicable, and it has become necessary, as is shown in our statement above given, to add a mixed class. This includes several cases (1) when two articles are named in the same paragraph, one receiving an ad valorem and the other a specific tax; (2) where one article receives both forms of tax; (3) where an article is classed according to value and then receives a specific tax for each class. Other combinations also occur, as where an article is classed according to value and receives a different ad valorem rate in each class, or again when classed according to specific characteristics and taxed at different ad valorem rates, but these combinations are classed as ad valorem rates. Specific rates

SCHEDULES	Paragraphs fixing rates			
	Total	Specific	Ad valorem	Mixed
A. Chemicals, Oils, and Paints.....	86	67	14	5
B. Earths, Earthenware, and Glassware.....	34	15	16	3
C. Metals, and manufactures of.....	70	46	9	15
D. Wood, and manufactures of.....	15	6	8	1
E. Sugar, Molasses, and manufactures of.....	4	2	...	2
F. Tobacco, and manufactures of.....	5	4	...	1
G. Agricultural Products and Provisions.....	71	58	6	7
H. Spirits, Wines, and other Beverages.....	12	11	...	1
I. Cotton manufactures.....	20	2	5	13
J. Flax, Hemp, and Jute, and manufactures of.....	25	9	5	11
K. Wool, and manufactures of.....	24	8	1	15
L. Silks and Silk Goods.....	8	1	3	4
M. Pulp, Paper, and Books.....	15	2	7	6
N. Sundries.....	55	15	32	8
Totals.....	444	246	106	92
Free List.....	242			

Customs duties are specific and ad valorem, the former being reckoned by the quantity of the goods imported (weight, measure, or number), and the latter by the value. Theoretically, the ad valorem duties are the preferable, as they adjust the amount of the burden to the value of the article. But they offer great practical difficulties in ascertaining the value of the goods. As the statements of the importers, even when made under oath, are not accepted as final evidence as to the value of the goods, a complex machinery for the ascertainment of values is a necessary adjunct to all ad valorem taxes. Hence the preference for specific duties, which can be imposed readily according to the physical characteristics of the objects imported. Such specific duties fall unequally upon objects of high value and low value in the same class. Thus, if all textiles were taxed 15 cents a square yard, such a tax would be prohibitive on print cloths, but insignificant upon silks. It is the plaint of the protectionist that specific duties protect only the lower grades of goods from foreign competition. The only method of mitigating this is to make a minute division into classes. The greater

predominate in the schedules A, C, F, G, and H, but in the others ad valorem and mixed rates prevail.

CLASSES	Duty collected, 1901	Average ad valorem rate, %
1. Sugar and Molasses.....	\$63,022,429	73.44
2. Cotton and manufactures of.....	21,826,690	54.87
3. Wool and manufactures of.....	21,575,005	70.21
4. Tobacco and manufactures.....	16,655,744	110.63
5. Silk and manufactures of.....	14,245,993	53.07
6. Fibres, vegetable, and manufactures of.....	12,908,017	37.27
7. Liquors, Malt, Distilled, and Wines.....	9,121,236	70.01
8. Tea.....	8,259,354	82.54
9. Iron and Steel and manufactures.....	6,988,479	38.15
10. Chemicals, Drugs, and Dyes.....	5,603,647	26.96
Total of all imports.....	\$180,206,294 232,641,500	..... 49.64

But if rates be many, they are not all equally significant. As indicated above, rates are fixed in 444 paragraphs of the tariff law, but many impose several rates, so that neither the number

of objects taxed nor the rates of taxation correspond to the number of paragraphs. The statistics of imports deal with individual articles or closely allied groups. From the figures for 1901 it appears that 78.3 per cent. of the entire customs revenue of the United States was derived from ten articles or groups. The figures are given in the preceding table, which also embraces the average ad valorem rate of taxation, found by comparing the amount of duty collected with the value of the goods imported.

The same concentration of revenue produced upon a few articles of importation is generally observed in other countries. Thus in England in 1901, tobacco and snuff, tea, and spirits produced 90.1 per cent. of the customs revenue, while in the German Empire in 1901, breadstuffs, petroleum, and coffee produced 55.8 per cent. of the customs revenue. The important rôle of the customs duties in the fiscal arrangements of modern States is shown in the following statement:

sure, impact, movement, resistance, weight, touch; hardness, roughness, wetness, and their opposites; warmth, heat, cold; pain, tickling, goose-flesh, pricking, tingling, creeping. When, however, the organ is explored, point for point, by mechanical, thermal, and electrical stimuli, it proves to be capable of four sensation qualities, and of four only: pressure, warmth, cold, pain. The so-called sensations of contact, weight, resistance, touch, smoothness, etc., are really perceptions, made up of sensations from the skin and from the underlying tissues. Pricking, tingling, etc., are in all probability circulatory sensations, aroused by change of blood-flow or blood-supply; their organs and mode of excitation are imperfectly known. We shall return to heat and tickling below; we now take up the cutaneous qualities in order.

(1) *Pressure*.—If a small point of cork or soft wood be set down firmly upon the skin surface, e.g. on the back of the hand, one of

COUNTRY	Year	Denomination	Total Revenue	Customs Revenue	Per cent. of Total
United States.....	1900-01	Dollars	699,300,000	238,500,000	34.1
Great Britain.....	1901	Pounds st.	114,800,000	26,300,000	23.0
Russia.....	1898	Rubles	1,584,900,000	218,900,000	13.9
German Empire.....	1898-99	Marks	1,539,000,000	475,800,000	30.9
France.....	1898	Fraucs	3,613,200,000	505,900,000	14.0
Italy.....	1900	Lire	1,715,900,000	243,000,000	14.2

Consult: United States Tariff Law of 1897; Annual Reports of Commerce and Navigation; Statistical Abstracts of the United Kingdom and of the principal foreign countries. See FREE TRADE; TARIFF; TAX.

CUSTOMS OF WAR. See WAR; HONORS OF WAR; SALUTES; LAWS AND USAGES OF WAR.

CUSTOS ROTULORUM (Lat., keeper of the rolls, or records). An office of great antiquity and dignity in England. It is usually held by the first civil officer of the county, as the Lord Lieutenant, though the actual custody of the records of the sessions of the peace and of the commission of the peace, constituting by eminence 'the rolls' of the county, is vested by statute in the clerk of the peace. Formerly the office was filled by appointment of the Lord Chancellor, but it has for over three hundred years been conferred by the Crown. The Keeper of the Rolls is always one of the commission of the peace, though the title of the office points to ministerial rather than to judicial functions.

CUSTOZZA, kōō-stōd'zā. A village in the Province of Verona, North Italy, situated 16 miles southwest of Verona (Map: Italy, E2). On July 25, 1848, and on June 24, 1866, the Italians were defeated here by the Austrians. (See ITALY, *History*.) In 1879 a monument was erected to the fallen. Population, in 1881, 624.

CÜSTRIN, ku-strēn'. See KÜSTRIN.

CUTANEOUS SENSATIONS (Fr. *cutané*, Port., It. *cutaneo*, from Lat. *cutis*, skin). The sensations aroused by stimulation of skin and mucous membrane. The term 'cutaneous' is applied to all these sensations, although one of them, the sensation of pain, is derived not from the cutis proper, but from the epidermis. (See SKIN.) The skin has been credited, in one or another psychological system, with a large number of sensations: sensations of contact, pres-

sure, two things will happen: either it will arouse a dull, vague, diffuse pressure sensation, or it will arouse a sharp, distinct pressure, the kind of sensation that one might suppose to come from the inward pressure of a little hard seed lodged in the cutis (Goldscheider). If the point be now applied lightly, we get either no sensation at all, or (at the place where the seed-pressure was before produced) a light, fine, rather ticklish pressure sensation. The seed-pressure and the ticklish pressure come from the organs of the pressure sense, the 'pressure spots,' as they are called. The dull pressure with intensive stimulation is set up by the indirect affection of several pressure spots; the stimulus makes an indentation in the skin, and the dragging down of the tissue squeezes the pressure organs that lie about the point of application. The absence of sensation with light contact means that the experimenter has applied the stimulus at a point of the skin which has no pressure organ. We see, then, from this simple experiment, that the skin is not uniformly sensitive to pressure; it may rather be compared to a mosaic of tiny blocks, some of which are sensitive, while the rest are insensitive, to mechanical stimulation.

A careful exploration of the cutaneous surface, undertaken with the object of mapping the pressure spots, has led to two definite results. (a) If the portion of the skin explored is hairy, the pressure spot lies always to windward of a hair-shaft, immediately above a hair-bulb. It follows that the nerve-skein which enfolds the bulb is the terminal organ of pressure, and that the hairs are as truly sense-apparatus in man as they are, e.g. in the cats. (b) If the region is hairless, pressure spots, arranged in lines and groups, can still be identified. The organs in this case are the corpuscles of Meissner.

(2) *Warmth and Cold*.—If the blunt point of an ordinary lead-pencil be drawn slowly over the back of the hand, it will give rise, from time

to time, to little flashes of cold; over the rest of its course, it will arouse nothing but pressure sensations. If the point be warmed, and drawn in the same way over the closed eyelid, it will give rise, from time to time, to little dots of warm sensation; at other points, it excites nothing but pressure. There is, then, a mosaic of temperature organs as there is a mosaic of pressure organs. Moreover, if a small square or circle of skin is accurately marked, and explored twice over, once with a cooled and once with a warmed point of metal, it will be found that the cold and warm spots do not coincide. A 'cold spot' never gives a warm sensation; a 'warm spot' never responds to stimulation by a cold sensation. While, therefore, we are justified, physically, in speaking of 'degrees' of temperature, and in arranging 'warms' and 'colds' upon a single thermometric scale, we must recognize the fact that, psychologically regarded, warmth and cold are distinct things; there are two temperature senses, each with its own distribution and its peculiar terminal organs. The organs of cold are more numerous than those of warmth. They are to be found, probably, in the end-bulbs of Krause, while the organs of warmth are the cylinders of Ruffini (von Frey). All these cutaneous organs are of extremely simple structure, consisting of little more than a skein or tangle of nerve-fibrils, twined about a cluster of connective-tissue cells. All alike are readily fatigued; and all show differences of responsiveness of 'attunement,' some answering a given stimulus with an intensive, others with a weak sensation.

(3) *Pain*.—If a small area of skin, say, upon the back of the hand, be shaved, moistened, stretched taut, and explored, point for point, by a fine horse-hair or needle, sensations of pain—more closely distributed than any of the three preceding sensations—will be obtained. The pain sensations are the most delicate, the smallest, so to speak, of all the skin sensations. The pain quality is unmistakable; even a novice will have no difficulty, after the first few trials, in distinguishing it from the ticklish quality of fine pressures. Moreover, if a pressure spot be very accurately localized, and the needle-point thrust into its centre, no sensation of pain will be aroused. The temperature spots are similarly analgesic. Hence there can be no doubt that pain is a new, fourth sense, endowed with organs of its own.

These organs are, in all probability, the free nerve-endings in the epidermis. The epidermis lies, like a layer of stiff leather, upon the elastic cutis. When, then, the skin is lightly touched, the resulting vibration passes *through* the epidermis to the underlying cutis; the epidermis, with its organs, is not stimulated at all. When, however, the skin is bruised, so that the epidermis is actually broken or crushed; or when the epidermis is itself explored, under experimental conditions that render it accessible to stimulation; then the pain quality is evoked. The mechanical character of cutis and epidermis thus enables us to explain the apparently paradoxical fact that the pain organs are placed more superficially than the organs of pressure, and yet that, under ordinary circumstances, it takes less stimulation to call out pressure than to excite pain.

(4) *Heat*.—We have seen that warm spots

give only sensations of warmth, and cold spots only sensations of cold. It is remarkable that, while the cold spots do not as a rule respond to warm stimuli—as, indeed, we should not expect them to do—they respond, by a distinct cold sensation, to heated stimuli of some 45° C. or over (von Frey's 'paradoxical cold'). No explanation can at present be offered. Stranger still is the experience that, if a piece of metal, heated to this temperature, be laid upon a portion of the skin that is furnished with both cold and warm spots, the result of the combined excitations is not warmth, or cold, or pain, but an altogether new quality, the quality of heat. A good place for experimentation is the median line of the forehead, close up to the hair. Raise the temperature of the metal from 40° upward, by 1° steps. For the first few trials you get nothing but a mild warmth, from the warm spots. But as soon as you pass the critical temperature (the heat that, if the metal were a point, would evoke from a cold spot the paradoxical cold sensation), you get a distinct sense of heat. Again, no explanation can be given. It is noteworthy, however, that heat affords a good instance of the difference between a psychological and a psychophysical sensation. (See ELEMENTS, CONSCIOUS.) To introspection, heat is a sensation, entirely unanalyzable; but when we take account of its bodily conditions, it appears as a fusion, a mixture of the stimulus qualities warm and cold.

(5) *Tickling*.—The psychophysics of this sensation complex is still obscure. Tickling may be set up, at certain parts of the cutaneous surface, by light intermittent pressure, or even by a single light touch. The resulting pressure sensations are (a) in some way diffused, so that the area of sensation presently becomes much larger than the area of original stimulation. Concomitant sensations of pressure (see COMMON SENSATION) may also be aroused in remote regions of the skin. It is possible (b) that the smooth muscle-fibres at the roots of the hairs, the muscles that cause the hair to 'stand on end' and whose contraction produces goose-flesh, may contain sensory nerve-endings which functionate in the tickling complex. (c) The occasional thrills of warmth which are characteristic of tickling are due, apparently, not to mechanical stimulation of the warm spots, but to a change of blood-supply in the vessels of the cutis. Weak pressure or blowing upon the skin is known to increase the arterial blood-pressure. (d) The movements of withdrawal have been ascribed to the unpleasantness of the intermittent stimulation; a flickering light, a beating tone, an interrupted pressure, are all disagreeable. While this statement may contain a part of the truth, it seems probable that the movements are referable, in part at least, to reflex connections between the sensory and motor nerves, akin to the connections which, on the purely sensory side, subserve concomitant sensation. Moreover, laughter is the direct motor response to tickling, and unpleasantness does not arise unless the stimulation be long continued. (e) For theories of the connection of laughter with tickling, see LAUGHTER.

We have spoken, so far, only of the 'external' skin. The 'internal skin' of the body, or mucous membrane, is sensitive to pressure and pain over most, if not all, of its extent. It is, however,

very weakly if at all sensitive to temperature from the pharynx downward.

BIBLIOGRAPHY. For a general account of experimental work upon the cutaneous 'spots,' consult: Titchener, *Experimental Psychology* (New York, 1901); Donaldson, *Mind* (London, 1885); for the quality of heat, Alrutz, *Mind*, vols. vi., vii. (London, 1897-98); for tickling, Kuelpe, *Outlines of Psychology* (London, 1895). See PAIN.

CUTCH or **KACHH** (Skt. *kaccha*, shore). A protected principality under the Presidency of Bombay, British India, occupying the peninsula south of Sindh, between the marshy tracts of the Rann of Cutch and the Gulf of Cutch. It covers an area of 6500 square miles (Map: India, A 4). Its soil is mostly sterile. The climate and meteorological conditions are extremely unfavorable for vegetation. The Rann is a morass nearly 7000 miles in area. It is flooded during the monsoon by salt water, but by December 1st it is comparatively dry. Cutch has a feudal system of government, the ruling power being confined to the dynasty of Jharija Rajput, of which there are about 200 members. The chief town is Bhuj and the principal seaport Mandvi. The population, in 1891, was 558,415; in 1901, 487,374. About one-third of the inhabitants are Mohammedans, the rest Hindus of various castes.

CUTCH, or **KACHH GUNDAVA**, gūn-dā'vā. A region in Baluchistan, east of Khelat. The Hala range of mountains extends along the western frontier (Map: Central Asia, E 4). The soil is rich, producing grain and cotton. The climate is damp and unhealthful.

CUTCH, GULF OF. An inlet on the northern border of the Arabian Sea, lying between Cutch and the peninsula of Kathiawar, British India (Map: India, A 4). It is about 30 miles wide and 100 miles long, and connects at its upper end with the Little Rann (or Rann) of Cutch, and through this with the great western Rann, the remarkable salt marshes lying to the east and north of Cutch.

CUTHBERT, kŭth'bĕrt. A town and the county-seat of Randolph County, Ga., about 120 miles southwest of Macon; on the Central of Georgia and the Georgia, Florida and Alabama railroads (Map: Georgia, B 4). It contains colleges for young men and women. Cuthbert is the commercial centre of a fertile agricultural and fruit-growing section. Population, in 1890, 2328; in 1900, 2641.

CUTHBERT, SAINT (c.635-687). Bishop of Lindisfarne and one of the most popular saints in England in the Middle Ages. He was born about 635, probably of Lowland Scotch parents. In 651, moved by a vision of angels carrying to heaven the soul of Saint Aidan, he entered the monastery of Melrose. Ten years later he was put at the head of this monastery, and did noble missionary work in the surrounding country. He left it in 676 for an austere hermit life, from which he was withdrawn in 684 to accept the bishopric of Hexham, which he exchanged for that of Lindisfarne, holding the latter only two years and returning to his solitary hut on Farne Island. Here he died, March 20, 687.

The influence of Saint Cuthbert upon his contemporaries was great, but his fame became even greater after his death. His body remained at Lindisfarne till 875, when the monks, bearing

it on their shoulders, fled from the fury of the Danes. After many wanderings through the south of Scotland and the north of England, they found a resting-place at Chester-le-Street in 883. In 995 the remains were transferred to Ripon, and then to Durham, where, inclosed in a costly shrine, and believed to work frequent miracles, they remained until the Reformation, when the shrine was defaced and the body buried under the pavement of the cathedral. The tomb was opened May 17, 1826, when a coffin ascertained to have been made in 1541 was found to inclose two others. The innermost case contained the skeleton of Saint Cuthbert, still entire, wrapped in five robes of embroidered silk, and also the head of King Oswald, killed in battle (642), which it was known had originally been buried with the saint. His life was twice written by the Venerable Bede, and still earlier by a monk of Lindisfarne. Besides these lives, all of which have been printed more than once, and what is told of him in Bede's *Historia Ecclesiastica Gentis Anglorum*, there are three modern lives, by Raine (Durham, 1828), Eyre (London, 1849; 3d ed. 1887), and Fryer (London, 1880).

CUTHBERT OF CANTERBURY (?-758). An English prelate. He was born in the Kingdom of Mercia, became Bishop of Hereford in 736, and Archbishop of Canterbury in 740. He died on October 26, 758. An instructive letter was addressed to him by Saint Boniface, in reply to one from him relating the doings of a council which determined upon closer relations between the English Church and that of Rome, in which Boniface shows that he too had adopted Roman usages. This letter has been printed more than once, and will be found in the appendix to Hussey's edition of Bede, *Historia Ecclesiastica* (Oxford, 1846).

CUTICLE. See SKIN.

CUTICLE (Lat. *cuticula*, dim. of *cutis*, skin). In plants, a hyaline film covering the surface of plants, and derived from the outer walls of the epidermal cells. The film consists of 'cutin,' which is a transparent, elastic substance, only slightly permeable to water. The process of formation of the cuticle is called 'cutinization' or 'cuticularization.' The term cuticle is sometimes loosely used instead of epidermis, and is not to be confused with the same term as used by zoölogists. See ANATOMY OF PLANTS.

CUTIN (in plants). See CUTICLE.

CUTINIZATION (in plants). See CUTICLE.

CUTLASS (Fr. *coutelas*, from OF. *couteel*, *cuttel*, Fr. *couteau*, knife, from Lat. *cutellus*, dim. of *culter*, knife). A short curved sword formerly used in men-of-war as a side arm for the men. The blade was usually about 27 inches long, an inch wide, and had a bowl-shaped guard on the hilt. See SWORN.

CUTLASS-FISH. A remarkable fish (*Trichiurus lepturus*), alone representing in this country a family (Trichiuridae, the hair-tails) of pelagic fishes allied to the sailfishes and better known elsewhere. Its body is long, band-like, tapering into a hair-like tail, scaleless, and covered with a glistening white skin, so that its resemblance to a sword or to a silver scabbard justifies the European 'scabbard-fish,' or the names 'swordfish,' prevalent along the Gulf

coast, and 'silver-fish,' heard in Florida. Its length may reach two or three feet, and it swims mostly at the surface, often leaping above it (whence another local name, 'skipjack') in pursuit of its prey: and it is sought by anglers both for sport and food. In Jamaica, indeed, it



CUTLASS FISH; MOUTH OPEN AND SHUT.

forms the object of a commercial fishery; and another species is the highly esteemed frostfish (q.v.) of New Zealand.

CUTLER, ELDRIDGE JEFFERSON (1831-70). An American scholar and poet, born at Hollister, Mass. He was professor of modern languages at Harvard from 1865 until his death. His works include *War Poems* (1867) and *Stella* (1868). In addition to his creative work, he wrote much valuable criticism.

CUTLER, MANASSEH (1742-1823). An American clergyman and botanist. He was born in Killingly, Conn., graduated at Yale in 1765, and in 1767 was admitted to the bar. He then studied theology, was licensed to preach in 1770, and from 1771 until his death was pastor of Hamlet Parish, Ipswich, now the town of Hamilton, Mass. During the latter part of the Revolutionary War he served as chaplain of a Massachusetts regiment. He subsequently studied medicine and botany, and was the first to make a systematic study of the plants of New England, 350 species of which he classified in accordance with the Linnæan system. As the representative of a number of old Revolutionary soldiers, he contracted with Congress for 1,500,000 acres of the public lands northwest of the Ohio, and in 1788 materially assisted the party of Connecticut farmers who, under the lead of Rufus Putnam (q.v.), founded Marietta, Ohio (q.v.). He is generally credited, moreover, with having made the first draft of the famous Ordinance of 1787. He himself went to Marietta in 1788, but soon returned to Massachusetts, and from 1801 to 1805 was a member of Congress. He was a frequent contributor on scientific subjects to the *Proceedings* of the American Academy, and wrote the chapter on trees and plants in Belknap's *History of New Hampshire*. Consult William P. and Julia P. Cutler, *The Life Journals, and Correspondence of Manasseh Cutler* (Cincinnati, 1888).

CUTLER, TIMOTHY (1683-1765). An American clergyman. He was born at Charlestown, Mass.; graduated at Harvard in 1701, became president of Yale College in 1719, but was forced to resign (1722) on account of his prelatial tendencies. He went to England and was ordained a minister of the Church of England by the Bishop of Norwich (1723), and received the degree of D.D. from both Oxford and Cambridge; he returned to Boston, became rector of Christ Church (1723), and died there, August, 1765.

CUTLERY (from *cutler*, AF. *coteller*, OF. *cotellier*, Fr. *coutelier*, from ML. *cuttellarius*, knife-maker, from Lat. *cuttellus*, little knife).

A term broadly applied to cutting instruments in general, but as more commonly employed its use is limited to such cutting utensils as pocket, pen, and table knives, razors, shears, and scissors. Shells and sharp-edged stones formed the rudest and most ancient cutting instruments. These were followed by bronze weapons and instruments which were used by the Romans as late as the beginning of the Christian Era. In the remains of Pompeii, however, knives, shears, and lancets were found made of iron or steel as well as bronze. During the Middle Ages, when the chivalry of the period sought the best equipment, certain cities of Spain and Italy acquired a high reputation for the manufacture of cutting instruments, especially of swords. The knives used by the Anglo-Saxons resembled in appearance the modern razor-blade. Forks were used only for serving, as the custom of eating with forks, which was introduced from Italy, was not known in England until the time of James I. Knives were not placed on the table until about the close of the fifteenth century, and each person carried a knife with him for use whenever the exigencies of dining required other instruments than his fingers. As early as the reign of Richard I. Sheffield had gained a reputation for the excellence of its *whittles*, and in 1417 the cutlers of London obtained a charter from Henry V. In the seventeenth century, when England had acquired a reputation throughout Europe for the quality of its cutlery, Birmingham was regarded as the centre of the industry; but during the nineteenth century Sheffield regained its old preëminence.

The manufacture of table cutlery in the United States began in 1832, when a factory was built at Saccarappa, Maine. With the improvement of the quality and lowering of the price of American steel, the industry has steadily developed. The annual product now amounts in value to between \$3,000,000 and \$4,000,000, of which less than 5 per cent. is exported. America excels in the production of 'medium' goods—that is, goods of tasteful design and good quality at a moderate price; but in the manufacture of other branches of cutlery it has not been so successful. Although it is claimed that an equally good quality is produced at home, still the United States imports from England large quantities of the finest grades. In the very cheap grades, such as vegetable and other kitchen knives which retail in this country for a few cents apiece, America cannot compete with Germany. The first pocket knives were made in a Connecticut factory in 1842, and many English workmen, attracted by high prices and steady employment, came over from Sheffield to work in the Connecticut shops. Some of these afterwards migrated to Walden, N. Y., where they built a coöperative factory, and since that time over fifty factories, many of them coöperative, have been established, a number of which have failed, while others have sold out, or have been reorganized as corporations. The piece system of paying the operative still prevails to a large extent in cutlery shops. All the early cutlery was hand-forged, and this practice is still general in England and in the United States for the manufacture of some of the best pocket and pen knives. In the latter country to-day, however, large quantities of pocket and pen knives and apparently all table knives and most carving and

butcher knives are machine-forged. Machinery is used for driving the various grinding-stones, emery and buffing wheels for finishing blades and handles. In some instances, also, the blades are placed in holders and manipulated by automatic machinery for the rough grinding. The evil effects from the grinding dust are now obviated, as far as possible, by wet grinding and by exhaust fans and ducts for removing the dust. The hand and machine processes for making different kinds and grades of cutlery vary greatly in detail. But a fair general idea of the industry may be gained by first describing the actual operations of an American pocket and pen knife factory where hand-forged goods are made, and then indicating in a more general way some points of difference in the manufacture of other kinds of cutlery.

POCKET AND PEN KNIVES. Each knife, roughly speaking, consists of two parts, the blade and the handle, but each of these, from the manufacturer's standpoint, is composed of a number of parts. The blade consists of the blade proper or cutting edge and its supporting back, and of the tang, or the portion which joins the blade to the handle. The handle, in turn, includes (1) the horn, ivory, or other material which is grasped by the hand, and which portion alone is technically called the handle; (2) the scale, which is the brass or iron lining of the handle; and (3) the spring, which, besides its primary purpose of controlling the blade in opening and shutting, also closes the back of the lining.

The edge-tool steel from which pocket and pen knife blades are made is called rod steel; it is flat, of proper widths for the different sizes of blades, and of thickness one gauge greater than the finished blade. In the best goods the blades are forged and shaped by hand. In the case of cheap knives, the blades are pressed into rough shape by mauls, then further shaped or forged by trip-hammers in much the same manner as that explained below in describing table-knives. Comparatively little machinery is used on the blades in either case, except that the grindstones and finishing wheels are driven by mechanical power. The processes here described relate to high-grade goods.

Mooring is the name given to the rough shaping of the blade at the first heat, and the formation of the tang is called *tangling*. After these two processes are completed the metal is heated for the third time, the blade again worked by hammer, and the nail-mark cut, which finishes the third or *smithing* process. All the forging is done by means of special hammers on special anvils, both imported from England. *Choothing* is filing the little nick just between the cutting edge and the tang. This removes a weak spot in the metal and serves as a guide in filing the blade flatwise. The blade is now shaped in the rough, but before it leaves the forge it must be hardened and tempered. *Hardening* is effected by bringing it to a red heat and dipping it in water up to the choil. The tang is left soft, so it may be readily filed, drilled, stamped with maker's name, and fitted in the handle. *Tempering* (q.v.) is often accomplished by bringing the blades to a purple heat on a thin copper plate, resting on the fire of the forge. The blades are set on their backs, thus keeping their edges furthest from the heat. The final work of the forger or smith is to straighten crooked blades,

if any, by means of light hammer-blows on the concave side of the blade.

Grinding is next in order. The grinder places the tang in a holder, which he grasps with one hand, while with the other hand, protected by a leather patch, he presses the blade against the rapidly revolving power-driven stone. *Racing-irons*, consisting of small rods of Norway iron, are occasionally held against the face of the stone to restore the rough surface and preserve its cylindrical shape. *Material* is the name given to all the separate parts except the blade. The *material-maker* presses out, or cuts out with dies, the steel springs and the brass or iron linings, and fastens the tips or bolsters to the outside of the lining, in case the material forming the handle proper does not cover the tip ends of the lining. *Cutler's work*, curiously enough, includes assembling, or putting together, the various parts of the knife, including drilling, filing, fitting, polishing, and buffing the handles. The material for handles embraces ivory, pearl, silver and gold, tortoise-shell, buffalo and stag horn, celluloid, rubber, California redwood, cocoa wood, and ebony. *Polishing* the handles is accomplished by power-driven built-up wood wheels, covered first with leather, then with a mixture of glue and emery. *Buffing* is effected on wheels in which the leather, emery, and glue give place to cotton cloth, fastened on edge around a wheel or spindle. *Blade-finishing* is done on emery wheels, much like the polishing-wheels already described, except that the glue and emery are placed on very hard leather, instead of on wood. *Glazing*, on these wheels, removes the dirt and gives a glazed finish. *Crocus finish* is a superior glaze, or polish, requiring special wheels.

Sharpening is done by hand, on flat stones. The edges of the blades are held at an angle of 45° with the stone, a point that might well be borne in mind by all who attempt to sharpen old knives. The common practice of holding the knives flat on the stone gives a thin, easily broken edge. Finally, the handles are again buffed and the whole knife wiped, packed, and boxed. The ordinary knife of fair quality has now gone through about 100 operations, while the finest goods receive 200 to 300. It may be added that the processes involved in machine-forged pocket and pen knives resemble those described for table-knives in the next paragraph.

TABLE CUTLERY, including ordinary and carving knives, and also forks, is chiefly made by machinery in America, and largely or wholly by hand in England. Knife-blades and tangs are roughly shaped by rolling or by trip or drop hammers, and are brought to a uniform shape and size by means of dies. The blades are hardened in oil, which is sometimes burned or blazed off. They are sometimes heated in a sand-bath to secure the desired color and temper. The holes in the tang are punched and the blades are ground on large power-driven stones, five to seven feet in diameter. Where machinery is used at every possible point the blades are rough-ground by placing six or more in a brass frame, which is so manipulated as to give them both a side to side and vertical motion on the stone. The finish, however, is done by hand, on wheels similar in general character to those explained in describing pocket knives. The highest grades of steel table-knives receive more hand work, but

the cheaper ones have even less, and the handle, and in some cases the whole knife, are cast instead of wrought. The same is likewise true of forks. Wooden handles are generally in two pieces, united to the tang, but ivory, bone, horn, and various other materials are in one piece, with the tang inserted. The curved tines of forks are shaped by means of presses, or dies, and the tines are rough-cut in the same general manner. In some instances more or less forging, either by hand or machine, is employed. Silver-plated (see ELECTRO-PLATING) table knives and forks are plated on steel, or on some softer malleable metal.

SCISSORS and SHEARS differ principally as to length, the dividing line in the trade being six inches, and the shorter instruments being classed as scissors. Some of the cheapest scissors are cast, but the best ones are hand-forged. English shears are of steel, but some of the best American shears, which are now largely exported, have their inner sides only of steel, 'laid on' to shear blades of malleable iron, often cast in outside foundries.

RAZORS, at least those of good quality, are practically all hand-forged from razor-steel, in much the same general way as pocket knives, but with greater care. *Safety razors* of various types are provided with guards designed to make cutting the flesh impossible. The earliest safety razor is said to have been made by Michael Hunter, of Sheffield, England, about 1875. It was merely an ordinary razor with a guard. The later safety razors have detachable blades and adjustable guards. The cutting edge is generally shorter than in the ordinary razor, in some cases not much over an inch in length. Consult Landrin, *Die Kunst des Messerschmiedes* . . . (Weimar, 1836); Page, *La coutellerie depuis l'origine jusqu'à nos jours* (4 vols., Châtellerault, 1896-98).

CUTLIPS. A curious sucker (*Lagochila lacera*) of the streams of the central Mississippi Valley, distinguished at sight by its mouth, where the reduced lower lip is divided into two distinct, elongated lobes; the lower lip, further, is "entirely separated from the upper at the angles by a deep fissure," cloaked by the skin of the cheek. It is olive or brown above, silvery on the sides and belly, and the lower fins are faintly orange. Many names have been given this singular fish, such as hare-lip, or split-mouth, or rabbit-mouth, sucker, and May sucker.

CUTPURSE, MOLL. The sobriquet of Mary Frith, a notorious character born in London about 1584, a thief and prostitute and famous in almost every form of crime. She dressed in male attire and is said to furnish the first recorded instance of the use of tobacco by a woman.

CUTTACK, küt-tük', or KATAK (Skt. *Kataka*). The capital of the district of the same name in Bengal, British India, situated on the southern bank of the Mahanadi, at the apex of its delta, 220 miles southwest of Calcutta (Map: India, E 4). It contains the ruins of an old fort, and it is famous for its fine filigree work in gold and silver. Population, in 1891, 47,186; in 1901, 51,364.

CUTTER. The name given to a portion of the equipment of boats on board of a man-of-war. They are double-banked and are fitted either for

rowing or sailing. In sailing ships, a nest of cutters of varying sizes used to be stowed amidships, one within the other, the launch being the bottom boat of all. At present, the boats are either swung at the davits or in cradles resting on frames amidships, clear of the blast of the guns. A large ship may carry as many as four pulling cutters, in addition to one or more steam launches, and various other boats. (See BOAT.) The name cutter is also applied to a small vessel with a single mast, a mainsail, a forestaysail, and a jib set to the bowsprit end. Cutter yachts are sloop-rigged vessels, and the name is now generally applied to sloops of considerable draught and comparatively small beam.

A *revenue cutter* is a light, armed Government vessel, commissioned for the prevention of smuggling and the enforcement of the customs regulations. (See REVENUE CUTTER SERVICE, UNITED STATES.) A small, light sleigh with a single seat for one or two persons, usually drawn by one horse, is also called a cutter.

CUTTER, GEORGE WASHINGTON (1801-65). An American poet. He was born in Massachusetts, and, after studying law, settled in Kentucky. He fought with distinction in the Mexican War, and later entered the political arena, where he soon became known as a brilliant public speaker. His most celebrated poems are "The Song of Steam," "The Song of the Lightning," and "E Pluribus Unum." His works were published under the respective titles: *Bucna Vista and Other Poems* (1848); *Song of Steam and Other Poems* (1857); and *Poems, National and Patriotic* (1857).

CUTTHROAT TROUT. The Rocky Mountain or black-spotted trout (*Salmo mykiss*). See TROUT.

CUTTING. A detached portion of a plant inserted in soil or water for the purpose of propagation. This process, one of the oldest forms of artificial reproduction, is also one of the most important. Plants in general lend themselves readily to the process, thus enabling the propagator to secure hundreds of offspring from a single individual. Cuttings are superior to seeds, because, with the exception of bud variations, plants so propagated come true to kind, i.e. varieties of cultivated plants which do not come true to sort by seeds can be perpetuated by cuttings. In its sphere, propagation by cuttings is as important to commercial horticulture as the art of budding or grafting. While a great majority of the cultivated plants are capable of being increased by one form of cutting or another, it is not economical so to increase them, and other means are resorted to. Cuttings are made from such a variety of parts of plants—sometimes even from root, stem and leaf of the same plant—that a corresponding number of styles of cuttings have been developed. In general, cuttings are made from hard wood or soft wood or herbaceous plants, and are classified accordingly: under each general head there are a number of subdivisions, depending upon the plant employed or the manner of making the cutting, as:

Hard-wood cuttings	{	(1) Simple stem,
		(2) Single eye,
		(3) Hoel,
		(4) Mallet, etc.
Soft-wood (herbaceous) cuttings	{	(1) Stem-cuttings—slips,
		(2) Leaf-cuttings,
		(3) Root, rootstalk or rhizome,
		(4) Tubers, etc.

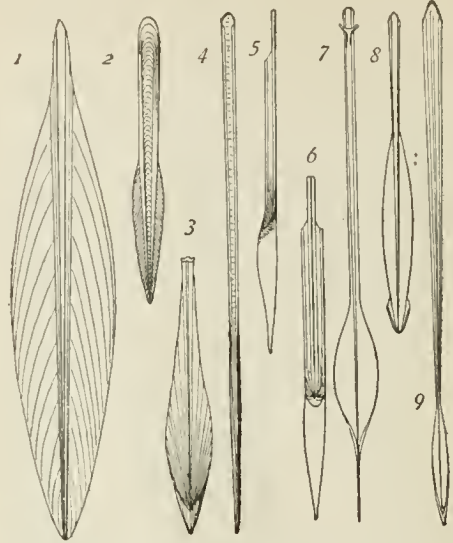
Some conception of the importance of this means of increasing plants can be gathered from the fact that, except for the production of new varieties, all commercial varieties of grapes, currants, and gooseberries are increased in this way, while among flowering and ornamental bedding plants, millions are annually produced by one or another of these methods in the United States alone. Sugar-cane and pineapples are extensively perpetuated by this process.

The parts used in making cuttings are numerous, but the methods resorted to are as varied as interesting. Some plants root readily from cuttings placed in the open ground; others require special treatment before they will 'strike' root, while still others require most careful nursing in the greenhouse and even under a bell-jar to induce them to take root. Special devices, carrying a variety of soils, and capable of maintaining a given degree of heat and moisture, have been constructed, in order to facilitate the work of propagating plants by this means. Consult: Bailey, *The Nursery Book* (New York, 1896); article on "Cuttings," in *Cyclopedia of American Horticulture* (New York, 1900).

CUTTLE, Captain. A rough-looking, good-hearted, retired merchant-captain in Dicken's novel *Dombey and Son*. He had a hook in place of a right hand, with which he did everything, from frying sausages to wiping his forehead when excited. He was an intimate friend of Sol Gills and his nephew Walter, and took care of Florence Dombey when she was driven to leave her father's house. His favorite expression, "When found, make a note of," was adopted as the motto of *Notes and Queries*.

CUTTLEFISH (*cuttle*, AS. *cudde*; connected by popular etymology with *cuttle*, knife (on account of the knife-like cuttle-bone) + *fish*). A

least, to octopods. (See OCTOPODS.) The European cuttlefish (*Sepia*) furnishes cuttlefish-bone and sepia, which are of commercial importance. The former is the calcareous 'pen' or brace which lies along the 'back' of the creature beneath the skin; and the sepia is the substance in its 'ink-bag,' by throwing out which it beclouds the water and eludes pursuit.



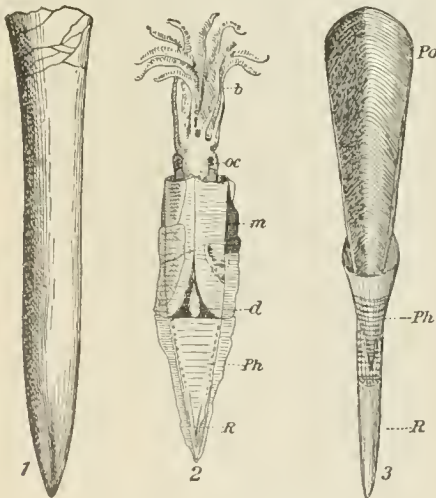
FORMS OF 'PENS' OF CUTTLEFISH.

1. Common North Atlantic Squid (*Loligo Pealei*). 2. *Histioteuthis Collinsi*. 3. *Sthenoteuthis ptaropus*; anterior end of pen, whose posterior end is spatulate. 4. *Chiroteuthis lacertosa*; ventral view. 5. *Moroteuthis robusta*; side-view. 6. The same; ventral view. 7. *Desmotenuthis hyperborea*. 8. *Lestoteuthis Fabricii*. 9. *Ommastrephes illecebrosus*.

Fossil cuttlefish-bones of *Sepia*, scarcely different from the modern species, are found in various Tertiary deposits. In the Triassic, Jurassic, and Cretaceous rocks are other forms of sepoid shells that are not calcified, but are thin, elongated, and horny, often containing fossilized ink-bags and hardened ink, which may still be prepared and used for drawing. *Sepia* and its allies are supposed to have evolved from Belemnite-like forms through such intermediate stages as the genus *Belosepia* of the Tertiary. See CEPHALOPODA; SQUID; and Colored Plate of OCTOPODA AND DECAPODA in article DECAPODS.

CUTTS, EDWARD LEWES. An English clergyman. He graduated at Queen's College, Cambridge, was ordained in 1848 to the ministry of the Established Church, and between 1848 and 1859 was curate successively of Ide Hill (Kent), Coggeshall (Essex), and Kelvedon (Essex). From 1859 to 1865 he was curate of Billericay (Essex), and in 1871 was appointed vicar of the Church of the Holy Trinity, Haverstock-hill, London, S.W. In 1865-71 he was secretary of the Additional Curates Society.

CUTTYHUNK. The most southerly island in Buzzard's Bay, Mass., on which the first settlement of white men in any part of New England was made. Sailing from Falmouth, England, March 25, 1602, Bartholomew Gosnold, in the ship *Concord*, with "32 persons, whereof 8 were mariners and sailors, 12 proposing upon the discovery to return with the ship for



FOSSIL CUTTLEFISH (BELEMNITES).

1. A belemnite (*Pachyteuthis acutus*) from the Lower Lias, England. 2. A belemnite (*Belemnoteuthis antiqua*) from the Oxford Clay, England, partly restored: *b*, arms; *oc*, eyes; *m*, mouth; *d*, ink-bag; *Ph*, phragmacone; *R*, guard. 3. Restoration of a belemnite's shell: *Po*, proboscitracum; *Ph*, phragmacone; *R*, guard. See BELEMNITE.

popular name of certain cephalopods, originally applied to a calamary (*Sepia officinalis*), but now generally restricted, in the United States at

England, the rest to remain there for population," made land off the coast of Maine on May 14. Coasting southwesterly he discovered and named Cape Cod, and, coming "amongst many fair islands, all lying within a league or two, one of another, and the outermost not above 5 or 7 leagues from the main," landed on Cuttyhunk on the 25th of May. This they called Elizabeth's Isle, after the Queen, and here they built a fort. On account of disagreements, the settlement was abandoned on June 18, and the colonists returned to England. Cuttyhunk, whose name is contracted from the Indian *Toocutohhunkounoh*, which may mean 'place of departure,' later became the home of many pilots, when New Bedford had 400 whaling ships. The winter population is 50, and in summer, in the club-houses and hotels, several hundred. The United States Life-Saving Station was established in 1889, and the house of the Massachusetts Humane Society in 1847. Consult *New England Magazine* (Boston, 1897).

CUTTY STOOL (Scotch *cuttie*, short, hussy, dim. of *cut* + *stool*). A seat once used in the Scottish Church for the exposure of offenders against chastity. The sinner was required to sit on the stool before the whole congregation during the entire service, and, at its close, to stand up while severely reprimanded by the minister.

CUTWORM. The terrestrial caterpillar of certain noctuid moths, mainly of the genus *Agrotis*, which winter and pupate in the ground and are ready to attack early vegetation. Cutworms are night mowers, and eat the plants off at the level of the ground, destroying far more than they can eat. They attack wheat, Indian corn, oats, and all the cereals, as well as garden vegetables. By day they hide under the surface of the soil, where each patch of withering vegetation marks their hiding-places. In vegetable beds these spots should be dug over, and the up-turned worms killed; holes made with a hoe or rake handle furnish favorite hiding-places by day, and thus serve as traps to catch many a worm. Some kinds of cutworms ascend trees by night and eat off tender leaves and buds, descending and hiding in the early morning. A widely distributed example is *Agrotis saucia*, a pest of orchards in both Europe and America.

CUVIER, *ku'vyá'*, FRÉDÉRIC (1773-1838). A French naturalist, born at Montbéliard. He was professor of zoölogy in the Jardin des Plantes, Paris, and keeper of the collection in comparative anatomy at that institution. His published works include: *Sur les dents des mammifères comme caractères zoölogiques* (1825); and *Histoire naturelle des mammifères* (jointly with Geoffroy de Saint-Hilaire, 1819-29). He was a brother of the celebrated Baron Georges Léopold de Cuvier.

CUVIER, GEORGES LÉOPOLD CHRÉTIEN FRÉDÉRIC DAGOBERT, BARON DE (1769-1832). A French naturalist, founder of the science of comparative anatomy, born at Montbéliard, then in the Duchy of Württemberg, to which place his father, formerly an officer in a Swiss mercenary regiment, had retired on a pension. He was educated at home in the strictest tenets of the French Protestant or Calvinistic faith, and at the age of fourteen entered the academy at Stuttgart, where he remained four years. His father intended him for the ministry, but he showed such a love for natural history that he was allowed to spend his time

in pursuing such studies in that branch of science as the academy afforded, and supplemented them with reading almost every scientific book in the library. In 1788, he became tutor in the family of the Comte d'Héricy, a Protestant nobleman living near Caen, on the coast of Normandy. Here, during the stormy years of the Reign of Terror, he remained, quietly utilizing the rather unusual facilities the neighborhood offered for the study of marine animal life and fossil remains, thus laying the foundations of his future eminence. A chance acquaintance with the Abbé Tessier, a writer on agricultural subjects, who was struck with young Cuvier's remarkable knowledge of zoölogy, secured for him an introduction to Geoffroy Saint-Hilaire, who at once recognized in Cuvier a man of genius, and urged him to move to Paris. Here, in 1795, he became, through the influence of Lacépède, Lamarck, and others, assistant to Mertrud, the professor of comparative anatomy at the Musée d'Histoire Naturelle. He immediately took a high position among the scientists in Paris, and was chosen one of the original members of the Institute upon its organization in 1795. In 1796 he was chosen professor of natural history at the central school of the Panthéon, and in 1800 he succeeded Daubenton in a similar position at the Collège de France. In 1802 he succeeded Mertrud at the Jardin des Plantes. In 1798 appeared his first separate work, *Tableau élémentaire de l'histoire naturelle des animaux*, in which he introduced tentatively his classification of animals upon which so much of his fame rests. Between 1800 and 1805 were published the five volumes of his *Leçons d'anatomie*, which brought together the hitherto disconnected knowledge of comparative anatomy, and gave him the right to be considered the founder of that branch of science. In 1800 he published his first work on paleontology, *Mémoires sur les espèces d'éléphants vivants et fossiles*. At the opening of the nineteenth century, therefore, Cuvier may be said to have already attracted the attention of the scientific world to the three branches with which his name will always be connected.

Cuvier began his career as an administrator in 1802, when he was appointed an inspector of education under the Consulate, and helped establish *lycées* at Marseilles, Bordeaux, and Nice. From 1808 to 1813, as a member of the council of the Imperial University under Napoleon, he spent considerable time in Italy, Holland, and Germany, organizing the academies in the districts recently annexed to the Empire. In 1814 Napoleon made him a Councilor of State, a position which he continued to hold under Louis XVIII. In 1819 he became president of the Committee of the Interior, and chancellor of the University of Paris. He was made a member of the Academy in 1818, and a grand officer of the Legion of Honor in 1826. In 1822 he was appointed grand master of the faculties of Protestant theology, in which position he had supervision of all the civil, political, and religious affairs of Protestant institutions and organizations. In 1831 Louis Philippe made him a peer of France, and in 1832, shortly before his death, was considering him for the office of Minister of the Interior.

With all his administrative duties, Cuvier still found time and opportunity to pursue his scientific investigations. His life work falls natu-

rally into three divisions; paleontology, systematic zoölogy, and comparative anatomy. In each of these departments, he achieved remarkable success, and left a lasting impression, in spite of mistakes due largely to personal peculiarities derived from his Calvinistic training, such as his refusal to accept the theory of descent. His investigations in paleontology marked a great advance over the existing knowledge of the subject. By means of his knowledge of comparative anatomy, and his theory of the correlation of growth, Cuvier 'reconstructed' a large number of extinct animals, proving that every geological epoch is represented by distinct animal forms, having a similarity well defined to animals in preceding or succeeding epochs. Nevertheless, he held to the Linnean doctrine of the constancy of species, and looked upon the similarity of animal forms in successive epochs as a recurrence of types rather than a steady development of the same type. In comparative anatomy his work in special fields was as remarkable as it was valuable. His investigations of the comparative anatomy of fishes, and of the osteology of mammals, may be mentioned as two of his most valuable contributions to zoölogy. In systematic zoölogy his work was of great originality and importance, for to him is due the reclassification of the animal kingdom on a natural basis, in place of the artificial and arbitrary classification of Linnæus. Cuvier's system was based on the constancy and morphological resemblance of types, rather than on outward similarities of structure, as in the Linnean system. It remained the standard arrangement of animals until set aside by modern investigators, who studied the relationship of animals in the light of their ontogeny and phylogeny. Cuvier's great work, *Le règne animal* (1816), became at once the standard reference book in natural history; several editions were issued, and the work was translated into English and other languages, and profoundly influenced zoölogical studies everywhere.

Among his published works not noted above may be mentioned: *Les reptiles douteux* (1807); *Recherches sur les ossements fossiles des quadrupèdes* (1812); *Mémoire pour servir à l'histoire et à l'anatomie des mollusques* (1816); *Description géologique des environs de Paris* (1822); *Histoire naturelle des poissons* (1828); *Discours sur les révolutions de la surface du globe et sur les changements qu'elles ont produits dans le règne animal* (1851). Consult: Lee, *Memoirs of Baron Cuvier* (New York, 1833; French translation, Paris, 1833); Flourens, *Histoire des travaux de Georges Cuvier* (Paris, 1845); Duerotay de Blainville, *Cuvier et Geoffroy Saint-Hilaire* (Paris, 1890).

CUVILLIER-FLEURY, ku've'yá'flé're'. ALFRED AUGUSTE (1802-87). A French author, born in Paris. His love of letters brought him to the attention of the Duc d'Orléans and he was made by him tutor to his son, the Duc d'Aumale (1827). These duties ended, he became a political writer on the *Journal des Débats*. In 1866 he was made a member of the Academy. Among his works are: *Voyages et voyageurs* (1837-54); *Etudes historiques et littéraires* (1854); *Nouvelles études historiques et littéraires* (1855); *Dernières études historiques et littéraires* (1859); *Historiens, poètes et romanciers* (1863); *Etudes et portraits* (1865-68); *Post-*

humes et revenants (1878). The Duc d'Aumale wrote an interesting biography of his tutor, published in *Le Livre du Centenaire des Débats*.

CUXHA'VEN, Ger. pron. koo'ks'hü-fen. A German seaport and watering-place on the North Sea, at the mouth of the Elbe, about 57 miles west-northwest of Hamburg, to which it belongs (Map: Germany, C 2). Great harbor works have been erected here in recent years. Cuxhaven is the station of the Hamburg pilots. The coast defenses consist of a series of strong detached forts. There is a handsome old castle dating from the fourteenth century. Population, in 1900, 6906. See HAMBURG.

CUYABÁ, kw'yá-bá'. An episcopal city of Brazil, the capital of the State of Matto Grosso, situated on the Cuyabá River (Map: Brazil, F 7). It has broad, well-paved streets and contains barracks, an arsenal, and a military hospital. The town was formerly famous for gold and diamond mines, and is now an important commercial centre. Cuyabá was founded in 1820 by miners, and since 1840 has been the capital of the State. Population, in 1890, 17,815.

CUYLER, kí'ter, THEODORE LEDYARD (1822—). An American Presbyterian clergyman. He was born at Aurora, N. Y., January 10, 1822; graduated at Princeton in 1841 and at Princeton Theological Seminary in 1846. After holding a charge in New Jersey, he became pastor of the Market Street Reformed Dutch Church, New York, in 1853, and pastor of the Lafayette Avenue Presbyterian Church, Brooklyn, from 1860 to 1890. In the latter year he resigned the active charge and was presented with a purse of \$30,000. He then entered upon a ministry at large and preached frequently and in many places. His eightieth birthday was publicly celebrated in Brooklyn. He has written many religious works, and a large number of articles in religious newspapers.

CUYP, koip, ALBERT (1620-91). A Dutch painter, born at Dort, in October, 1620. His father, Jakob Gerrits Cuyp, a portrait painter of mediocre ability, was his first master. The son painted animals, still life, and even portraits, but his best work was his landscapes. These were at first executed in the manner of Van Goyen, but later on he was much influenced by Rembrandt. He was a close student of nature, and his paintings are characterized by rich color and a skillful handling of life. Most of his works are preserved in England, especially in the Royal collection. Among the best of them are "Evening," in the National Gallery, London; "Banks of a Lake," in Grosvenor House; and two famous views of the "Meuse Near Dort," one in Bridgewater Gallery and the other at Dorchester House. Consult Buxton, *German, Flemish, and Dutch Painters* (London, 1881).

CUYPERS, koip'ers, PETER (1827—). A Dutch architect, born at Roermond. He studied at the Academy of Antwerp, and became a prominent Dutch representative of the Gothic style. The Royal Museum at Amsterdam is by him. He also restored several churches of the Middle Ages, among them the Mainz Cathedral, and built a number of important church edifices, including those of Saint Jacob at the Hague, Saint Barbara at Breda, Saint Catharine at Eindhoven, the Sacred Heart at Amsterdam, and Saint Boniface at Leeuwarden.

CUZA, koo'zá. See ALEXANDER JOHN I.

CUZCO, kōos'kō, *Castilian Sp. pron. kōōth'kō* (Quichua, navel, as being the centre of the ancient Inca Empire). An episcopal city, the capital of the department of the same name, Peru, situated on the eastern end of that section of the Andes known as the Knot of Cuzco, 11,000 feet above sea-level, and 528 miles southeast of Lima (Map: Peru, C 6). It is regularly built in part, and contains several handsome buildings, prominent among which is the Cathedral of Santo Domingo, in the Corinthian style. There are also hospitals, a university founded in 1692, a national college, and a museum. The city is the centre of a fertile agricultural district, and has considerable trade and manufactures of cotton and woolen goods, refined sugar, leather, and embroidery. Population, about 30,000. Cuzco, the capital of the Incas, is said to have been founded in the eleventh century. It retains evidences of its former splendor, although the ancient city was destroyed by Pizarro in 1535. These remains include the palace of the Incas, a fortress built of massive and irregular stone blocks, the temple of the Sun, and the temple of the virgins of the Sun.

CUZCO. One of the largest departments of Peru, bounded by Loreto on the north, Bolivia on the east, Puno and Arequipa on the south, and Apurimac, Ayacucho, and Junin on the west (Map: Peru, C 6). Area estimated at over 156,000 square miles. The southern and western parts are mountainous, and the eastern and northern are low and covered with thick forests. The department is to a large extent unexplored, and only a small portion in the south is inhabited. It is watered by the Urabamba and the headstreams of many tributaries of the Amazon. The population is chiefly engaged in agriculture and cattle-raising. Population, officially estimated in 1896 at 438,646. Capital, Cuzco (q.v.).

CYAM'ELIDE. See CYANIC ACID; WÖHLER.

CYANE, sī'á-nē (Lat., from Gk. Κρανῆ, *Kranē*). In Greek legend, the wife of Æolus, the god of the winds. Also a nymph, playmate of Persephone. She was transformed into the spring Cyane near Syracuse at the time when Hades carried off Persephone from this neighborhood.

CYANIC ACID (from Gk. κύανος, *kyanos*, dark-blue). An unstable compound of carbon, hydrogen, oxygen, and nitrogen, obtained by heating cyanuric acid (q.v.) in a current of carbon dioxide. Under ordinary conditions it is a volatile liquid having a strong pungent odor, but is readily transformed into a white, porcelain-like mass of the same percentage composition as cyanic acid, though probably of much higher molecular weight. This *polymeric* modification of cyanic acid is known as *cyanetide*. (See WÖHLER.) Among the salts of cyanic acid may be mentioned the cyanate of potassium and the cyanate of ammonium. Potassium cyanate may be readily obtained by cautiously heating a mixture of potassium ferrocyanide and potassium bichromate; when pure it forms a white crystalline powder readily soluble in water, in which, however, it gradually undergoes decomposition. Ammonium cyanate may be obtained from the cyanate of potassium by double decomposition. The transformation of ammonium cyanate into

urea, observed by Wöhler in 1828, constituted the first synthesis of an organic compound and formed an event of the greatest importance in the history of chemistry.

The careful study to which many derivatives of cyanic acid have been subjected has led to the view that cyanic acid may possess two different constitutional formulas, viz. $N \equiv C - O - H$ and $O = C = N - H$. All efforts to produce two different compounds corresponding to those formulas having failed, chemists have proposed to explain this comparatively rare phenomenon on the following hypotheses: (1) Cyanic acid, like most other organic compounds, has a definite structure—say $N \equiv C - O - H$; but while, during some of its transformations, that structure remains unaltered, other transformations involve an intra-molecular change resulting in the formation of derivatives of the compound $O = C = N - H$ ('iso-cyanic acid'), which is, for some unknown reason, less stable than the compound $N \equiv C - O - H$ and incapable of existing in the free state. (2) According to another hypothesis, every single molecule of the acid is constantly changing its structure, its hydrogen atom rapidly oscillating between the nitrogen and the oxygen; so that while at a given instant the structure of the molecule might be represented by the formula $N \equiv C - O - H$, we would find its structure to be $O = C = N - H$ if we could stop the motion of the hydrogen atom at the very next instant. The substance is thus imagined to be composed, at any instant, of two different kinds of molecules; and as under certain conditions each kind may be capable of transformations which the other kind could not undergo, two series of derivatives should be expected, according to the nature of the transformations necessary to produce those derivatives and to the conditions under which the transformations take place.

CY'ANIDES. See HYDROCYANIC ACID.

CY'ANITE (from Gk. κύανος, *kyanos*, dark-blue), KYANITE, DISTHENE, or SÁPARE. An aluminum silicate that crystallizes in the triclinic system. Although sometimes gray or green, it usually has a blue color and a vitreous to pearly lustre. The handsomest specimens are found in the Saint Gothard region in Switzerland; in the United States, Chesterfield, Mass., and Bakersfield, N. C., are well-known localities. Fine specimens have been cut as gems, but as a rule the material is too soft for wear.

CYANOGEN (Gk. κύανος, *kyanos*, dark-blue + γένος, *genōs*, producing, from γίγνεσθαι, *gignesthai*, Lat. *gignere*, Skt. *jan*, to be born). An important compound of carbon and nitrogen obtained by heating dry cyanide of mercury in hard glass tubes. It is a poisonous gas, having a peculiar odor and dissolving quite readily in water and in alcohol. If ignited in air it burns with a purple flame, its carbon combining with the oxygen of the air to form carbon dioxide, while its nitrogen is set free. When dry, cyanogen is an exceedingly stable substance and may be heated as high as 800° C. without being decomposed; in aqueous solution, however, it gradually undergoes a series of chemical changes resulting in the formation of ammonia, hydrocyanic acid, urea, oxalic acid, and other compounds. The molecular formula of cyanogen is C_2N_2 , its molecule being composed of two 'cyan-

ogen groups' (CN, or, as it is often written, Cy), which enter into the composition of a large number of other substances known. Some of these interesting substances having a blue color, the name cyanogen has been applied to the gas from which they are derived; but that gas itself is perfectly colorless. During the preparation of cyanogen from the cyanide of mercury, an amorphous brown substance forms, which has the same percentage composition as cyanogen, but probably a much higher molecular weight; this compound is called *paracyanogen* and is denoted by the symbol (CN)_x. Paracyanogen may be readily transformed into cyanogen gas by heating.

The derivatives of cyanogen form a large group of compounds, including hydrocyanic acid and its salts, the ferro-cyanides and ferri-cyanides, cyanic and cyanuric acids and their derivatives, etc. The most important of these compounds are described in special articles.

CYANOIDEA (Neo-Lat. nom. pl., from Gk. *κύανος*, *kyanos*, dark-blue + *είδος*, *eidos*, form). A suborder of the Carnivora (q.v.), composed of the family Canidae (dogs, wolves, jackals, etc.), regarded as forming the most central group of the Carnivora, from which the bears, weasels, and raccoons (Aretaidea) depart on the one hand, and the cats, civets, and hyenas (Ailuroida) depart on the other. Consult Huxley, *Anatomy of Vertebrated Animals* (New York, 1878), and the books mentioned under MAMMALLA, Dog, Fox, etc.

CYANOMETER (Gk. *κύανος*, *kyanos*, dark-blue + *μέτρον*, *metron*, measure). An instrument for determining the color of the sky, invented by Saussure—a disk divided into sections, the several sections being tinted and gradually increasing in intensity from white to deep blue. When used to compare with the color of the sky, some of its sections will appear deeper and some lighter in tint. The section where there is no perceptible difference gives the measure or degree of the blueness of the sky.

CYANOPHYCEÆ (Neo-Lat. nom. pl., from Gk. *κύανος*, *kyanos*, dark-blue + *φύκος*, *phykos*, seaweed). The lowest of the four great groups of alga. They are called blue-green alga from the prevailing color of the cell contents, which are tinted by a diffused blue pigment named phycocyan. The cell-structure is very simple, agreeing in this respect with the Bacteria (q.v.). For details of cell-structure and classification, see ALGÆ.

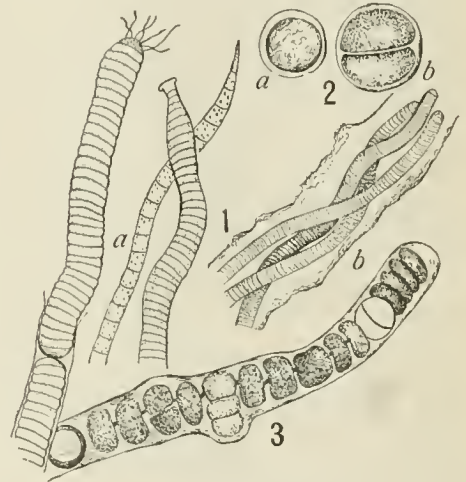
Many of the Cyanophyceæ are one-celled, or consist of indefinite aggregations of cells situated in a common gelatinous matrix. Other forms are filamentous, and some are elaborately branched. A well-known unbranched form is *Oscillatoria*, interesting because of the movements of the tip of the filament, which swings in a circle. *Nostoc* forms large gelatinous balls filled with convoluted chains of cells. Certain cells in some filamentous forms lose their protoplasmic contents, becoming the so-called heterocysts, whose functions are not well understood; but they are responsible in many cases for the branching of the filaments, because the heterocysts become firmly fastened to the sheaths that inclose the vegetative cells. The growth of the latter causes such pressure between the fixed points, determined by the heterocysts, that the

sheath is ruptured and the filament grows out at one side. Such branching is termed 'false branching.' Branches or portions of filaments that break off and start new plants are called homogonia.

The Cyanophyceæ are especially fond of warm shallow water, although many grow in damp situations on land, such as spray-wet rocks, damp timber, and earth. They live among the reeking vegetation of salt marshes, and flourish in open sewers and drains. The fouling of shallow reservoirs in warm weather, when they give off the well-known 'pig-pen odor,' is generally due to growth of Cyanophyceæ. The only remedy is to deepen the water.

One of the most remarkable displays of Cyanophyceæ is in warm springs, well illustrated in Yellowstone National Park, where the growths are brilliantly colored. Here certain species grow luxuriantly in water at a temperature of 75° C. and above, conditions which no other forms of alga can endure.

Another conspicuous display of blue-green alga is the water-bloom or scum that frequently covers the surface of ponds and small lakes. Most of the water-blooms are due to



CYANOPHYCEÆ.

1, *a* and *b*, *Oscillatoria*; 2, *Chroococcus* (*a*), and its division (*b*); 3, *Stigonema*, showing false branching and heterocysts.

Cyanophyceæ, and the largest of all has given name to the Red Sea, whose tint is due to the presence of a flocculent sediment made up of bundles of short filaments of *Trichodesmium*. This peculiar condition of the ocean is not confined to the Red Sea, but has been reported off the coast of Brazil and South Carolina, and in the Indian and Pacific oceans.

The best monograph on the Cyanophyceæ is Bornet and Flahault, *Nostocacées Heterocystées* (Paris, 1886-88).

CYANO'PHYLL (Gk. *κύανος*, *kyanos*, dark-blue + *φύλλον*, *phyllon*, leaf). A collective name for the blue coloring substance of leaves and flowers. See COLOR.

CYANO'SIS (from Gk. *κύανος*, *kyanos*, dark-blue). Lividity of the skin, caused by interruption of the circulation or of the respiration. It may be temporary, as in a convulsion, when the face or lips are blue, or in croup (q.v.), where

the Medes some twenty-eight years. Media at last threw off the Scythian yoke, and Cyaxares once more successfully engaged the Assyrians and conquered Nineveh and the surrounding provinces with the exception of Babylon. The reign of Cyaxares lasted forty years, including the Scythian domination, and his name is often mentioned in the Old Persian inscriptions as the one to whom the rebel princes of Media, who revolted against Darius, traced back their lineage in claiming the throne. See MEDIA.

CYAXARES II. According to Xenophon (Cyp. i. 5.2), a grandson of Cyaxares I. (q.v.) and son of Astyages, and maternal uncle of Cyrus the Great. On the authority of Herodotus, however, it is generally believed that Astyages had no son, and it has been suggested that Cyaxares II. may have been the brother of Astyages and son of Cyaxares I. His identity with Ahasuerus of the Bible has likewise, but with uncertainty, been suggested. In this way it has been thought that Cyaxares II. may perhaps be the same as Darius the Mede in the Book of Daniel, or even be identical with Gobryas. But the whole matter is complicated and uncertain. See DARIUS THE MEDE.

CYBELE, sîh'ê-lê (Gk. Κυβέλη, *Kybelê*, *Pêa*, *Rhea*), or RHEA CYBELE, or the GREAT MOTHER OF THE GODS. A divinity whose worship spread far and wide through the ancient world, though its early seats seem to have been Crete and Asia Minor. According to the myth which belonged to the worship of Zeus on Mount Ida, Rhea was the wife of Cronus and mother of Zeus, Poseidon, and Hades, i.e. of the ruling race of gods. In Asia Minor we find widespread worship of a nature goddess, regarded as the mother and source of all life, and honored with orgiastic rites upon the mountains and among the wild woods and caves. The wild beasts attended upon her, especially the lion, by whom her throne was watched and her car drawn. Her priests were called Corybantes. The Asiatic worship of Cybele had its origin apparently and certainly its chief centre at Pessinus in Phrygia, whence it passed into Lydia. United with the similar but less orgiastic Cretan cult of Rhea, it was early adopted by the Greeks of the mainland, and connected with local cults of a similar goddess. In Rome the worship of Cybele was introduced from Pessinus in B.C. 204, in consequence of the Sibylline prophecy, and the annual Megalensian games were established in her honor. From the first century B.C. this cult of the great Eastern goddess in various forms and under many names was spread among the people by wandering bands of begging priests and priestesses, professing to work wonders, predict the future, and by initiation into their mysteries to bring relief from sin. The priests of Cybele in Asia Minor were eunuchs, in imitation of the mutilation of Attis (q.v.), the original servant of the goddess. In works of art she is usually represented as seated on a throne, adorned with a mural crown, from which a veil is suspended. At either side of the throne are lions, or perhaps a lion lies on her lap or under her feet. Sometimes she is seen riding in a chariot drawn by lions.

CYCADACEÆ (Neo-Lat. nom. pl., from Neo-Lat. *cycas*, Gk. κύκας, *kykas*, African cocopalms). One of the four living groups of gymnosperms. In the present flora nine genera of

cycads are recognized, which contain about eighty species. They are exclusively tropical, and are about equally distributed between the eastern and western tropics. The stems are either columnar shafts, crowned with a rosette of huge fern-like foliage leaves, having the general habit of tree-ferns and palms; or they are like great tubers, completely invested by an armor of thick leaf-bases and scale leaves, and crowned with fern-like leaves as in the other case. The group is of especial interest on account of its fern-like characters, and there seems to be general consent that it is a group which has been derived from the ferns. Although fern-like in appearance and in many structures, the cycads produce seeds and must be associated with seed-plants, and since the seeds are exposed, they are gymnosperms.

A discovery recently made emphasizes strikingly their fern-like character. In fertilization the male cells bear many cilia and are free-swimming, while in all other known seed-plants they have no power of motion. This retention of the old ciliated sperm habit by undoubted seed-plants is a very interesting transition condition. The group is also of interest in showing that the pollen-tube, which is connected in other seed-plants with the transfer of the male cells to the egg, may not have been originally developed for this purpose. In the cycads the tube is developed by the pollen-grain, but it branches freely through the ovule and acts as an absorbing system, the male cells never entering it. It was probably later in the evolution of plants that this absorbing system came to be used as a means of transferring the male cells. Another characteristic feature of the group is that the seed-coat, instead of being entirely hard, as in the conifers, is plum-like, since it develops in two layers, the inner hard and bony, the outer pulpy, making the ripe fruit resemble a plum.

The structure of the stem in many cases is not essentially different from that of the ordinary conifer-stems, but in certain genera it presents unusual and suggestive features. In these cases the primary cambium, by means of which the ordinary increase in diameter is effected, is short-lived, and a series of secondary cambiums is organized in the cortex. The vascular bundles thus formed in the cortex are frequently of the concentric type, which is characteristic of the ferns and not of the seed-plants.

Although the strobili of the cycads have the general structure of those of conifers, in some cases the spore-leaves do not resemble those of the other seed-plants. For example, in the genus *Cycas* there is no distinct stamen in the ordinary sense, but a leaf-like body whose under surface is thickly covered with groups of sporangia, as in ordinary ferns.

The geographic distribution of cycads is as follows: In the Oriental tropics the genera are: *Cycas*, containing about sixteen species and ranging throughout tropical Asia, the East Indies, and the Australasian region; *Macrozamia*, with fourteen species, and the monotypic *Bowenia*, both strictly Australasian; *Enecephalartos*, with twelve species, and the monotypic *Stangeria*, both restricted to Africa. In the Occidental tropics the largest genus is *Zamia*, with about thirty species, ranging throughout tropical and subtropical America; *Ceratozamia*, with six species, and *Dioon*, with one species, are American;

CYCADS AND CYPRESS



1. CYPRESS TREE near Monterey, Cal.

2. CYCAS REVOLUTA, In New York Botanical Garden.

while the monotypic *Microcyas* belongs to Cuba. In general it is true that *Cycas* and *Zamia* are the typical cycads of the two hemispheres, while the other genera represent relatively isolated forms which bear the stamp of local conditions.

FOSSIL FORMS. The Cycadaceæ are a group of very great antiquity, the genus *Cycas* itself appearing to be the oldest of all the genera of the family, for it is known from the Carboniferous limestone. This singular type has, since that early time, persisted in modern vegetation, where it stands without any near relatives. The remains of Cycadaceæ attain their greatest development in the Mesozoic formations, especially in the Jurassic rocks (Purbeck and Wealden) of England and France, and in the Lower Cretaceous of the Black Hills of North America, in which latter formation the silicified short cylindrical stems with their closely crowded, spirally disposed leaf-bases are quite characteristic fossils. Also the leaves and fructification of the Cycadaceæ are of frequent occurrence in the Mesozoic beds of the Northern Hemisphere, showing that these plants flourished there in that era. In the Tertiary they are rare in Europe, though still occurring in southern Europe. Later their last survivors withdrew mostly to the Southern Hemisphere. With the fossil Cycadaceæ are usually mentioned the *Medullosæ*, remains of stems from the Carboniferous and Permian rocks, which show many points of resemblance to the Cycadaceæ, while departing from them in some important features. Consult: Von Sölm-Laubach, *Fossil Botany* (Oxford, 1891); Ward, "Description of the Species of Cycadeoidea or Fossil Cycadean Trunks from the Lower Cretaceous Rim of the Black Hills," *Proceedings of the United States National Museum*, vol. xxi. (Washington, 1899); id., "Description of a New Genus and Twenty New Species of Fossil Cycadean Trunks from the Jurassic of Wyoming," in *Proceedings of the Washington Academy of Science*, vol. i. (Washington, 1900).

CYCLADES, *sik'la-dēz* (Lat., from Gk. *Κυκλάδες*, *Kyklades*, from *κύκλος*, *kyklos*, circle). A portion of the archipelago lying southeast of Greece, in the Aegean Sea, comprising, according to the old geographers, the islands of Ceos (*Zea*, *Kea*), Cythnus (*Thermia*), Seriphus (*Serpho*), Siphnus (*Siphanto*), Gyaros, Syros (*Syra*), Paros, Antiparos, Andros, Tenos, Myconus, Delos, Rhenea, and Naxos (Map: Greece, F 4). This group, arranged in three series, was supposed to form a circle with the sacred island of Delos at its centre, and this belief accounts for the name of the group. The modern nomarchy of the Cyclades includes also the islands of Melos, Cimolus, Polyandrus, Sienus, Ios (*Nio*), Amorgos, Santorini (*Thera*), Anaphi, and a number of smaller islands, some of which were formerly grouped with the Sporades (q.v.). The total area is 923 square miles. The islands are mountainous, reaching an altitude of over 3000 feet in some instances. Some are of volcanic formation. They are generally scantily watered and sparsely wooded. They produce southern fruits, and large quantities of marble and other valuable building-stones are obtained from them. The population of the nomarchy (province) was 134,747 in 1896. The chief town is Hermopolis (q.v.), on *Syra*.

CYCLAMEN, *sik'la-mēn* (Neo Lat., from Gk. *κυκλάμιος*, *kyklamios*, from *κύκλος*, *kyklos*, circle; referring to its corolla). A genus of plants of the natural order Primulaceæ, having a wheel-shaped corolla; with a long reflexed limb, and flower-stalks twisted spirally downward after flowering. The species are herbaceous perennials, not numerous, and chiefly Alpine in the south of Europe. They have turnip-like, partly subterranean stems, which are very acrid, but nevertheless are greedily eaten by swine, and the plants are accordingly often designated sow-bread. They are drastic and emmenagogue. Several of the species are frequent in our flower-gardens, on account of the beauty and fragrance of their flowers. The most common species are *Cyclamen Europæum* and *Cyclamen latifolium*, the latter being the source from which are obtained many of the forms cultivated as Persian cyclamens. The corolla of *Cyclamen latifolium* is strongly reflexed, giving the flower a curious appearance. For illustration, see Plate of GREENHOUSE PLANTS.

CYCLE (Lat. *cyclos*, from Gk. *κύκλος*, *kyklos*, circle; connected with Skt. *cakra*, AS. *hucól*, Engl. *wheel*). A term used in chronology to denote an interval of time in which certain phenomena always recur in the same order. Cycles have chiefly arisen from the incommensurability of the periods of revolution of the earth and other celestial bodies. Our unit of time is the day of 24 hours, being the period of revolution of the earth round its axis. But neither the year—the period of the earth round the sun—nor the month—the period of the moon round the earth—can be measured by days, or even by hours, so as not to leave fractions. Cycles have been invented in such a way that after a certain number of revolutions of the body whose period is to be compared with that of the earth on her axis, the body shall at last occupy the same place in the heavens and calendar as it did when the cycle commenced. Of the numerous cycles or periods of this kind that have been invented, the more important are noticed under their specific names. See INDUCTION; METONIC CYCLE; PERIOD; GOLDEN NUMBER; etc.

CYC'LICAL FORMS (from *cyclic*, Lat. *cyclicus*, Gk. *κύκλικος*, *kyklikos*, circular, from *κύκλος*, *kyklos*, circle). In music, forms that consist of a cycle or series of movements, such as the suite, concerto, sonata, or symphony. The origin of cyclical forms is to be found in the form of the old overture, which consisted of three parts, the first and third being slow, while the middle part was lively. Gradually these three parts were extended and detached. In the older compositions the movements were alternately slow and fast. But soon it became customary to begin and end with a fast movement. In the modern symphony the customary arrangement is: (1) Fast; (2) slow; (3) fast; (4) fast. But Beethoven's "Sonata," opus 109, and Tchaikowsky's "Symphonic Pathétique," are two famous examples of cyclical compositions closing with a slow movement. Originally all the movements of a cyclical composition were written in the same key. The development of the sonata (q.v.) wrought a change in this direction, so that different keys (though always related to the fundamental) were assigned to the different movements. The first and last movements, however,

are always in the same key, which is considered the fundamental key of the whole work. If the first movement is in minor, the last is generally in the parallel major.

CYCLIC ANAPÆST. See VERSIFICATION.

CYCLIC CHORUS (Gk. κυκλικὸς χορὸς, *kyklikos choros*). The chorus of fifty men or boys which danced in a circle around the altar of Dionysus, during the dithyramb. See CHORUS.

CYCLIC DACTYL. See VERSIFICATION.

CYCLIC POETS (Gk. κυκλικὸὶ ποιηταὶ, *kyklikoi poietai*). The name was given by the later Greek grammarians to a class of minor epic poets, who wrote on subjects dealing with events preceding, as well as during and following, the Trojan War, and also on the Theban Myths, each poet limiting himself to a certain cycle (*κύκλος*) of events. The following titles are known to us: *Theogony, Titanomachy, Cypria, Little Iliad, Destruction of Troy, The Return, Telegony, Oedipodea, Thebais, Epigoni, and Ethiopis*. The scanty fragments with testimonia are best published by Kinkel, *Epicorum Græcorum Fragmenta* (Leipzig, 1877); also as an appendix to Welcker's *Der epische Cyclos* (Bonn, 1835-49). Horace, *Ars Poetica*, 136, uses *cyclicus scriptor* in a derogatory sense, but there is no evidence that this was a common connotation.

CYCLING (from *cycle*). The use or act of riding the cycle, either bicycle or tricycle. Although now a common utility of every-day business life, as well as a means of recreation, it had its origin at the beginning of the latter half of the nineteenth century in what was then an improved velocipede, and was only used for sport or recreation. (See BICYCLE.) The progress of cycling as a means of recreation has been very rapid, its greatest general popularity occurring between 1890 and 1900. At the beginning of the twentieth century it apparently has taken its real position as a permanent means of enjoyment and recreation, and an added means of locomotion for either business or pleasure. Apart from the many physical advantages derived from the practice of cycling as an exercise, it has been of inestimable benefit to the community at large, in that it has given to all a capacity of locomotion, which formerly none but those of ample means and leisure could enjoy; and, as a natural consequence, has developed a general interest in the many 'good roads' movements through the United States and England. Many long-distance tours have been accomplished by its means, notably that of Thomas Stevens, who, between April, 1884, and December, 1886, rode round the world; and Lenz, who (1892-94) rode a wheel carrying all his necessaries, as well as a camera, across America, Samoa, Japan, through China, Burma, India, Beloochistan, Persia, and Armenia. *Road racing* has always been a popular sport, and in the early nineties had attained such proportions that nearly every city and town throughout England and America had its annual road-racing fixtures. This phase of the sport is not now so general, but the annual road races of Chicago and those of the metropolitan district of New York are still events of considerable importance in the cycling world.

Track racing is entirely artificial, and confined usually to professional riders racing under unnatural conditions. Long-distance and relay races, such as have been held at Tattersall's, Chi-

ago, and Madison Square Garden, New York, while financially profitable to their projectors, have been very severely condemned as of no real value to the sport, and frequently injurious to the riders themselves. Several cycling associations exist for the benefit of tourists, notably the League of American Wheelmen, which supplies maps, and enables machines to be passed into Canada and back into the United States without any other expense or hindrance than the depositing of the L. A. W. membership tickets; and under some circumstances even this is not necessary. Similar advantages are obtained for tourists in Europe by the Cyclists' Touring Club of England, founded in 1873 with headquarters in London S.W. With this latter organization is allied the Touring Club of France, and the Deutsches Radfahrerbund. The military organizations of all the European countries include corps of specially equipped and drilled cyclists, whose principal duties are the transmission of orders and the securing of information; for which purposes their speed, their noiselessness, and the comparatively good roads which prevail have made them conspicuously useful. See ARMY ORGANIZATION; TACTICS, MILITARY.

CYCLOID (Gk. κύκλωειδης, *kykloideîs*, circle-like, from κύκλος, *kyklos*, circle + εἶδος, *eîdos*, form). A plane curve, the locus of a point on the circumference of a circle which rolls along a straight line. If, in Fig. 1, circle O rolls on the line A_1A_2 , the point P traces the arc of the cycloid A_1PA_2 . If the generating point is taken

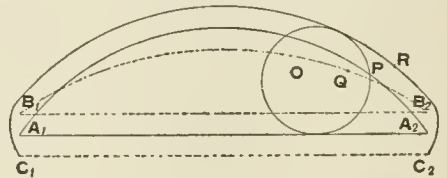


FIG. 1.

at Q, within the circle, the resulting curve is B_1QB_2 , called a prolate cycloid. If the generating point is taken at R, in the plane of the circle, the resulting curve is C_1RC_2 , a curtate cycloid or

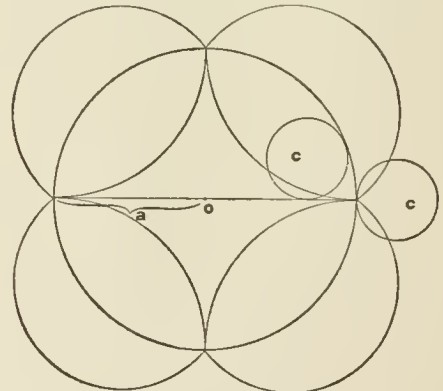


FIG. 2.

trochoid. If the generating circle rolls on a fixed circle, instead of a straight line, curves like those in Fig. 2 are produced (see CARDIOID). The curve formed by rolling the generating circle

around the outside of the fixed circumference is called an epicycloid. On the other hand, that produced by rolling the generating circle on the inside of the fixed circle is called a hypocycloid. These curves belong to a general class called 'ronlettes.' The construction for the cycloid was known to Bouvelles (1503), but its name is due to Galilei (q.v.), who in a letter to Torricelli (1639) recommends it for bridge arches. The term trochoid is due to Roberval (q.v.), and the term roulette (1659) to Pascal (q.v.). Roberval also effected (1634) the quadrature of the cycloid, showing that it equals three times the area of the generating circle, and he determined the volume obtained by revolution about its axis. Descartes constructed its tangents, and Pascal (1658) determined the length of its arc, and the centre of gravity of its surface and of the corresponding solid of revolution. The length of one branch of the cycloid is four times the diameter of the generating circle, and its area is three times that of the same circle. If A_1 (Fig. 1) be taken as the origin of coördinates, and a be the radius of the generating circle,

the equation of the cycloid is $x = a \text{ vers}^{-1} \left(\frac{y}{a} \right) - \sqrt{2ay - y^2}$. It is simpler, however, to use the expressions for x and y separately; viz. $x = a (\theta - \sin \theta)$, $y = a (1 - \cos \theta)$. The equations of the hypocycloid are $x = \frac{(a-b) \cos \theta + b \cos \frac{(a-b)\theta}{b}}$, $y = (a-b) \sin \theta - b \sin \frac{(a-b)\theta}{b}$, where a and b

are the radii of the fixed and rolling circles. If the radius of the fixed circle is four times that of the rolling circle, the equation of the hypocycloid is $x^2 + y^2 = a^2$, a being the radius of the fixed circle, as in Fig. 2. Because of the elegance of its properties and because of its numerous applications in mechanics, the cycloid is the most important of the transcendental curves. One of its most interesting properties is that the time of descent from rest of a particle from any point on its inverted arc to the lowest point is the same; that is, the cycloid is an isochronous curve. Thus, on an ideally hard and smooth surface whose sections are cycloids, the particle, having reached the lowest point, will, through the momentum received in its fall, ascend the opposite branch to a height equal to that through which it fell, losing velocity at the same rate as it acquired it. The cycloid is also the curve of quickest descent; i. e. an object acted upon by the force of gravity, and setting out from any point of the cycloid, will reach any other point of this curve in shorter time than by following any other path. The cycloid is therefore referred to as the *brachistochrone* (Gr. βράχιστος, *brachistos*, shortest, and χρόνος, *chronos*, time). The problem of finding the brachistochrone was proposed by Jean (Johann) Bernoulli in 1696, and formed the first important step in the calculus of variations. It was solved by Bernoulli himself, by Leibnitz, Newton, L'Hôpital, and Jacques (Jakob) Bernoulli. For the interesting history of the cycloid, consult any of the best histories of mathematics, and also: Chasles, *Aperçu historique sur l'origine et le développement des méthodes en géométrie* (Paris, 1875); de Groningue, *Histoire de la cycloïde* (Hamburg, 1701); Tannery, "La cycloïde dans l'antiquité," in *Bulletin des sciences mathématiques* (Paris, 1883).

CY'CLOID FISHES. One of the four orders of fishes proposed by Agassiz, based on the character of the scales. Cycloid scales have the posterior or free margin smooth and not spinous. Cycloid-like ctenoid (q.v.) scales are not covered with enamel, and belong to many of the present as well as many fossil fishes. The chub and its allies are examples.

CYCLOM'ETER (Gk. κύκλος, *kyklos*, circle + μέτρον, *metron*, measure). An instrument for recording the revolutions of any rotating object, as of a carriage-wheel, bicycle-wheel, or certain parts of machinery. A similar instrument for measuring distances traversed is an odometer. This instrument, invented by Hudson, is extensively used by surveyors in collecting data for maps. It is commonly attached to the wheel of a wagon, or to a light vehicle drawn by hand. The term cyclometry is often applied to the method of measuring circumferences or areas of circles (q.v.), but more generally it refers to the theory of circular functions. See FUNCTIONS.

CY'CLONE. See STORM.

CY'CLOPÆ'DIA. See ENCYCLOPÆDIA.

CY'CLOPEAN ARCHITECTURE, or MASONRY. The name frequently used for an ancient wall of large, irregular stones, rudely hewn or quite unwrought. The term originated in Greece, where structures of this kind were fabled to have been the work of the Cyclopes. The ancients also attributed them to the Pelasgians (q.v.), whence such walls are sometimes called Pelasgian. The walls of Tiryns (q.v.), near Nauplia, are an example of the ruder style of Cyclopean masonry. They are of irregular unshapen stones, from 6 to 10 feet long, from 3 to 4 feet wide, and from 2 to 3 feet deep; the interstices are filled up by small stones, and clay mortar was employed to bind them, though it has now been washed away to a great extent. The walls of Mycenæ are in part of the same rude construction as at Tiryns, but near the Lion Gate they are faced with huge rectangular blocks, fitted in rudely horizontal courses, and the same style of masonry (but more carefully executed) is employed in the great beehive tombs. A portion of the wall of Mycenæ—probably of later date—is built of polygonal stones, carefully fitted so as to leave no interstices. Walls of the same general character are found in Asia Minor and Italy, where they surround many of the old Etruscan towns, though here the walls are more commonly in the rude ashlar masonry found at Mycenæ. While in Greece these walls belong for the most part to the Mycenaean period, and are probably to be attributed to the Achaean domination, it is not likely that this style of fortification was peculiar to any one race, as similar masonry has been found in China, and also in Peru, and on a smaller scale in the British Isles. Polygonal masonry, composed of carefully hewn and fitted blocks, is common in Greek works of later times, and the early walls of Troy, as well as the tombs already mentioned, show that the Mycenaean civilization was capable of building walls of hewn and fitted stones, as good as, or better than, those erected in the classical times. The Cyclopean architecture is discussed in histories of architecture (q.v.), or in works dealing with the Mycenaean Age (see ARCHÆOLOGY), or Etruria (q.v.). For a description of the remains

of Cyclopean architecture in Greece and Italy, consult: Middleton, *Grecian Remains in Italy* (London, 1812), a rare work; Dodwell, *Views and Descriptions of Cyclopean or Pelasgic Remains in Greece and Italy* (London, 1834); and, for a more general discussion, Petit-Radel, *Recherches sur les monuments cyclopiens* (Paris, 1841).

CYCLOPES, sī-klŏ'pēz (Lat., from Gk. κύκλω-πες, *kyklōpes*, round-eyed, from κύκλος, *kyklos*, circle + ὤψ, *ōps*, eye). In Greek mythology, a race of one-eyed monsters, described as follows: (1) Homeric Cyclopes, a wild, lawless, gigantic race of shepherds, inhabiting an island in the western sea. The most famous of these Cyclopes is the son of Poseidon, Polyphemus (q.v.). Homer describes him as one-eyed, and later poets attributed this characteristic to his companions. (2) The Hesiodic Cyclopes, Brontes, Stereopes, and Arges (that is, Thunder, Lightning, and Thunderbolt), each having one eye in the middle of his forehead. These were the sons of Uranus and Gæa. Hurlled into Tartarus by their father, but delivered by their mother, they helped Cronus to usurp the government of heaven. Cronus, however, in his turn, threw them back into Tartarus, from which they were again released by Zeus, whose servants they now became. Finally, they were slain by Apollo, because they forged the thunderbolt with which Zeus killed Asclepius. The Alexandrian and Roman poets represented them as the companions and assistants of Hephestus at his forge, which was situated in a volcano, as at Lipari or Etna. In this capacity they were frequently represented on works of art. (3) The Cyclopes, a people who had come from Thrace or Lycia to Argolis, and built the mighty walls of Tiryns, Mycenæ, and Argos for King Proteus. See CYCLOPEAN ARCHITECTURE.

CYC'CLOPS. A play by Euripides, following the Homeric account of the adventures of Odysseus with the Cyclopes, and remarkable as the only preserved specimen of a satyric drama. It has been translated by Shelley, who omitted a few passages.

CYC'CLORA'MA (Gk. κύκλος, *kyklos*, circle + δράμα, *horama*, sight). A painting placed on the walls of a cylindrical room representing a landscape, battlefield, or other subject, with true perspective. The spectator stands in the centre, and the effect is extremely realistic.

CYCLO'SIS (Neo-Lat., from Gk. κύκλωσις, *kyklōsis*, a surrounding, from κύκλος, *kyklos*, circle). The rotation of the protoplasm within a plant-cell. Only the outermost portions remain quiet. The various inclusions of the protoplasm, such as chloroplasts, nucleus, etc., are swept along with it. The mass descends on one side of the cell and ascends on the other. A line of no movement necessarily exists between the portions moving in opposite directions. See PROTOPLASM.

CYCLOS'TOMI (Neo-Lat. nom. pl., from Gk. κύκλος, *kyklos*, circle + στόμα, *stoma*, mouth). A class of eel-like marine animals, the lampreys and hags, regarded as the lowest existing vertebrates (excluding Amphioxus). They have eel-like bodies of very primitive construction. "The spinal column is represented merely by a thick, persistent notochord, inclosed in a sheath, with, in the lampreys, small cartilaginous processes

representing neural and hæmal arches. The skull is cartilaginous, and is peculiarly modified. Behind it in the lamprey is a remarkable basket-like apparatus, composed of cartilaginous processes. This branchial basket, as it is termed, supports the gill-sacs. The gill-sacs, of which there are either six or seven pairs, are the organs of respiration and represent the gills of the true fishes." They are, however, very differently arranged, opening externally in some forms by several gill-slits, and in others by only one, and communicating internally with the pharynx in diverse ways. Other organs do not differ so widely from those of the true fishes, the most remarkable fact being that there is only one nasal sac and nostril, instead of a pair. The round mouth, without jaws, suggests that of leeches. The Cyclostomi, which by some ichthyologists are regarded as an order (Marsipobranchii) of fishes, are bottom-keeping, voracious, slinky creatures, occasionally truly parasitic, and are traceable back to Paleozoic times.

FOSSIL FORMS. Minute teeth (conodonts), found in Paleozoic rocks, have been by some authors considered to be teeth of cyclostomid fishes, but they are more probably the teeth of carnivorous annelids like the modern Nereidæ. In the Caithness flagstones of the Old Red Sandstone of Devonian age, near Thurso in Scotland, are found numbers of a small, eel-like fossil, which has, with much probability of correctness, been referred to the cyclostomes. These small fossils, known as Palæospondylus, vary in length from one to two inches, and consist of an oblong skull, made of bony plates, armed anteriorly with small calcified cirri, and provided posteriorly with two long prolongations that parallel the vertebral column. From between these prolongations projects the long vertebral column, made up of distinct calcified elements, with neural spines in the abdominal region, and both neural and hæmal spines in the caudal region. A long, diphycecal tail-fin with very slender rays, of which those of the neural series are bifurcated, must have formed a powerful swimming organ for this small fish. This fossil, if it be a true cyclostome, differs from all others of the group in having a calcified skeleton. Consult: Dean, "The Devonian Lamprey, Palæospondylus Gunni, Traquair, with Notes on the Systematic Arrangement of the Fish-like Vertebrates," *Memoirs of the New York Academy of Sciences*, vol. ii., part i. (New York, 1899). This work includes a complete bibliography of fossil cyclostomes. See CONODONT; HAG-FISH; LAMPREY; and plate of LAMPREYS AND DOGFISH.

CY'CLO-SYM'METRY. See SYMMETRY.

CYCLUS (Lat., circle). A curious fossil crustacean found in the coal-measures of North America and Europe. It is of a circular, convex form, with usually a low median ridge on its dorsum, and its surface is either smooth, radially striated, or nodular. A pair of small sessile compound eyes, like those of the horseshoe crab, have been found near the anterior lateral margin of some American examples. These fossils are perhaps the larval stages of other crustaceans, like Belimurus, Euproops, Prestwichia, or Eurypterus, of which adult specimens are often found in the same beds with Cyclus. Consult: Woodward, "On the Genus Cyclus," *Geological Magazine*, vol. viii. (1870), and ser. 4, vol. i.

(London, 1894). See EURYPTERUS; PRESTWICHIA; XIPHIOSURA.

CYDIP'PE (Gk. Κυδίππη). The Athenian maiden craftily won by Acontius. For the details of the story, see ACONTIUS.

CYDNUS (Lat., from Gk. Κύδνος, *Kydnos*). A river of Cilicia, passing the city of Tarsus and emptying into the Mediterranean. It was on this river that Cleopatra made her voyage to meet Antony.

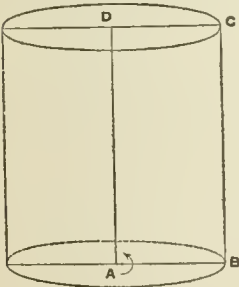
CYDONIA. See QUINCE.

CYGNÆ'US, FREDRIK (1807-81). A Finnish poet and literary historian. He was born at Tawastehus, and was educated at the University of Åbo, where he lectured from 1839 to 1843, in which year he began an extensive tour through Europe. In 1854 he was called to the chair of æsthetics and modern literature at the University of Helsingfors. He bequeathed his entire fortune and his valuable art collection to the State. His poetic works were published by him under the title *Skuldestycken* (6 vols., 1851-70).

CYGNÆUS, UNO (1810-88). A Finnish educator, born at Tawastehus. From 1837 to 1839 he was a pastor and instructor at Wiborg, from 1839 to 1846 spiritual director of the colony at Sitka, Alaska, and in 1861 was appointed chief inspector of the Finnish public-school system, which he thoroughly reorganized. In 1863 he established the first normal school in Finland, and until 1869 was its director. He was the first to make manual work (*slöjd*, *sloyd*) a part of regular public-school instruction. He published *Förslag rörande folkskoleväsendet* (1861).

CYGNUS (Lat., from Gk. Κύκνος, *Kyknos*, the swan). A constellation in the Northern Hemisphere, between Lyra and Cassiopeia. Several stars in this constellation have received the particular attention of astronomers. See STARS.

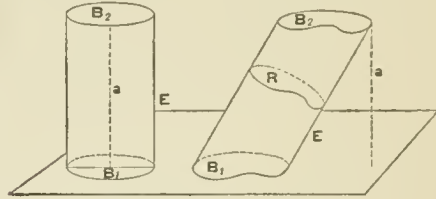
CYLINDER (OF. *cilindre*, Fr. *cylindre*, from Lat. *cylindrus*, from Gk. κύλινδρος, *kylindros*, roller, from κύλινδριν, *kylindrin*, κώλιν, *kylin*, to roll). A surface generated by a line (the generatrix) which moves parallel to a fixed line and touches a given curve (the directrix) is called a cylindrical surface. The space inclosed by a cylindrical surface is called a cylindrical space. The portion of a cylindrical space limited by two parallel planes cutting all the elements of the cylindrical surface is called a cylinder. If the directrix is a circle, the cylinder is called a circular cylinder; if the directrix is an ellipse, the cylinder is called an elliptic cylinder, and so on. If the elements (positions of the generatrix) are perpendicular to the plane of the directrix, the cylinder is called a right cylinder, otherwise it is called oblique. If a rectangle be revolved about one of its sides, a cylinder of revolution, or a right circular cylinder, is formed. The plane figures which form the ends of a cylinder are called



A CYLINDER OF REVOLUTION.

its bases, and these are always congruent. The perpendicular distance between the bases

is called the altitude. The lateral area of any cylinder, expressed in surface units, is the product of the number of linear units in the perimeter of a section perpendicular to the elements (right section) and the number of linear units in an element.* The number of units of volume of a cylinder is equal to the product of the number of square units of the base and the number of linear units in the altitude of the cylinder.



A RIGHT CIRCULAR CYLINDER. AN OBLIQUE CYLINDER.
B₁, B₂, lower and upper bases; E, an element; R, a right section, a, the altitude.

A cylindrical surface may be considered as a conical surface (see CONE) with the vertex at infinity. Hence, plane sections of the cylindrical space of a right circular cylinder lead to the so-called conic sections, in particular, to the ellipse. If $V \equiv$ volume, $C \equiv$ curved surface, $B \equiv$ base, $A \equiv$ total area of surfaces, $a \equiv$ altitude, $r \equiv$ radius of the base (or of the inscribed sphere) and $R \equiv$ the radius of the circumscribed sphere of a right circular cylinder, then $V = \pi r^2 a$, $C = 2\pi r a$, $A = 2\pi r^2 + 2\pi r a = 2\pi r (r + a)$, $R = \sqrt{\frac{a^2}{4} + r^2} = \frac{1}{2} \sqrt{a^2 + 4r^2}$. The volume of a sector of a cylinder of arc k° is $\frac{k}{360} \pi r^2 a$; if the arc is given in radian measure, as n radians, the volume is $\frac{1}{2} n r^2 a$. If a plane parallel to the axis cuts off a segment, the corresponding arc cut from the base being k° , the volume of the cylindrical segment is $V = \frac{r^2 a}{2} \left(\frac{k}{180} \pi - \sin k^\circ \right)$, or if $k^\circ = n$ radians, $V = \frac{r^2 a}{2} (n - \sin n)$.

CYLINDER-SNAKE. One of a family (Ilysiidæ) of small burrowing snakes allied to the Typhlopidae and shield-snakes, and retaining vestiges of pelvis and hind limbs, the latter showing in claw-like spurs protruding between the scales on each side of the vent. The form is cylindrical, the scales small, polished, and hardly larger on the belly than elsewhere, and the colors bright. The few species are scattered over the Malay Islands and Indo-China, where the common 'red snake' (*Cylindrophis rufus*) reaches a length of two and one-half feet, and occur in Ceylon and South America. A beautiful species (*Ilysia scytale*) in tropical South America is one of those called 'coral-snake,' and is coral-red with black rings. On account of its beauty, perfectly harmless nature, and 'for cooling purposes,' this snake is said to be sometimes worn as a necklace by the native ladies.

CYLLENE, sil-lē'nē (Lat., from Gk. Κυλλήνη, *Kyllēnē*). A mountain in northwest Arcadia,

the fabled birthplace of Hermes. Its modern name is Ziria. Height, 7790 feet.

CYLON (c.660-c.610 B.C.). An Athenian noble, who sought to make himself tyrant of Athens. He was victor at Olympia (B.C. 640), was son-in-law of Theages of Megara, and, probably in 630 (616 or 612), with the protection of the Delphic Oracle, and with outside help from Megara and a disaffected party in Athens, he seized the Acropolis of Athens. He was blockaded there by Megacles, an Alcmæonid, archon for the year, and surrendered on being promised his life, but was killed with his followers. The immediate result was war with Megara; the more lasting effect was the blood-guiltiness of the Alcmæonidæ, under cover of which they were so often attacked.

CYMA (Lat. *cyma*, hollow sphere, from Gk. κύμα, *kyma*, swelling, from κύω, *kýein*, to swell). In architecture, a molding, consisting of a hollow and round conjoined, each one about a quarter round. When hollowed in the upper part, it is termed *cyma recta*; when hollowed in the lower part, it is called *cyma reversa*. It is bounded usually by a fillet, and corresponds practically to the modern ogee molding.

CYMATIUM, sí-má'shí-üm. See ENTABLATURE.

CYMBALS (OF. *cimbale*, Fr. *cymbale*, Lat. *cymbalum*, Gk. κύμβαλον, *kymbalon*, from κύμβος, *kymbos*, cup, Skt. *kumbha*, pot, Ger. *Humpfe*, drinking-cup). Instruments of percussion in the form of round plates, with leather holders. When struck one against the other, they produce a loud, harsh sound of no fixed pitch. The best cymbals are those made in Turkey and China. Attempts to discover and imitate the composition of the metal have all failed. The notes in music for this instrument are written on the same line or space, in rhythmical succession. Although originally military instruments, cymbals are now much used in the orchestra.

CYMBELINE, sí-m'bé-lín or -lín, or CUNOBELINUS. A king of the Britons, who lived in the earlier part of the first century of our era. His capital was Colchester. In A.D. 40 Cymbeline banished his son Adminius, who made his submission to Caligula. The Emperor considered Britain a part of the Roman Empire, but no attempt was made to subdue the island till after the death of Cymbeline. In 43 Aulus Plautius was sent to Britain by Claudius, but was opposed by Togodumnus and Caractacus, the sons of Cymbeline. We have no other authentic information of Cymbeline except what may be derived from the few coins extant. The story of Cymbeline which Shakespeare used in the drama is found in Holinshed's *Chronicle* and is in large measure mythical. Consult Boswell-Stone, *Shakespeare's Holinshed* (London, 1896).

CYME, sím (Gk. κύμα, *kyma*, swelling). A flat-topped flower-cluster, in which the pedicels arise at different levels upon an elongated axis, and the innermost flowers bloom first. See INFLORESCENCE.

CYMRU or **KYMRU**, kím'rí. See WALES, paragraph *History*.

CYNANCHE, sí-nán'kè (Gk. κυνάγχη, *kynanchē*, dog-quinsy, from κύων, *kýōn*, dog + ἀγγχειν, *anchēin*, to press tight). An obsolete medical term applied to the severer forms of sore throat.

CYNANCHUM, sí-nán'küm. Several drugs, including the knotty, acrid emetic roots of *Cynanchum vincetoxicum*, a once reputed counterpoison; the nausea-producing leaves of *Cynanchum oleaeifolium*, an adulterant of Alexandria senna; and *Cynanchum monspeliacum*, formerly considered as the source of Montpellier scammony. See ASCLEPIADACEÆ.

CYNEWULF, kí'n'e-wulf, or **CYNWULF**, kí'n'wulf (AS., king-wolf) (c.750-c.825). A writer of some of the best Old English or Anglo-Saxon verse: *Juliana*, the story of the martyrdom of Saint Juliana; *Elene*, a legend of the discovery of the true cross by the Empress Helena; *Christ*, celebrating the coming of Christ, His ascension, and the day of judgment; the *Fates of the Apostles*; *Andreas*, or the *Legend of Saint Andrew*, and probably several other extant Old English poems. There is, however, no good reason for assigning to him (as is sometimes done) the riddles in the Exeter Book. About the poet nothing is positively known beyond what he himself has chosen to tell in his verse. In the first four poems cited above, he wove his name in runes. In the epilogue to *Elene*, he gave a brief sketch of himself, in which he speaks of his sinful youth, his conversion, his old age, and his reflection on poetic themes during the watches of the night. Cook has shown that Cynewulf's life must have been bounded very nearly by the years 750 and 825. It is further agreed, very generally, that the poet was an Anglian by birth; but it is uncertain whether his home was in Mercia, East Anglia, or Northumbria. Consult: Grein, *Bibliothek der angelsächsischen Poesie*, revised by Wülker (Göttingen, 1883-98); the editions of *Christ* by Gollancz (London, 1892); and by Cook (Boston, 1900); and Root, "The Legend of Saint Andrew," in *Yale Studies in English* (New York, 1899).

CYNICS (Lat. *cynicus*, Gk. κυνικός, *kynikos*, dog-like, cynic, from κύων, *kýōn*, dog). The name applied to a school of philosophers founded by Antisthenes, a pupil of Socrates. The main tenet of the extreme Cynics was that civilization is a curse, and true happiness can be obtained only by gratifying the most primary physical appetites which man has in common with the brutes. The general attitude of the Cynics, as distinguished from that of the Stoics, lay in the fact that while the Stoics regarded everything in the external material world with indifference, the Cynics viewed it with contempt. They were not an important philosophical school numerically, but attracted attention largely by their eccentricities and insolence. On account of their contempt for refinement, their name came subsequently to be applied to any one who takes a mean view of human life. The word cynic is probably derived from the Cynosarges gymnasium where Antisthenes taught. See ANTISTHENES; DIOGENES; MENIPPUS.

CYNODON, sí'nò-dòn (Neo-Lat., from Gk. κυνόδων, *kynodōn*, or κυνόδους, *kynodous*, dog-tooth, from κύων, *kýōn*, dog + ὀδός, *odous*, tooth). A genus of grasses, having digitate or racemose spikes, with spikelets on one side, glumes nearly equal, boat-shaped, and containing one floret, which has two awnless paleæ, the fruit coated with the hardened paleæ. The most important species is *Cynodon dactylon*, a grass very widely diffused, which is the principal fod-

der-grass and best pasture-grass of India, where it is the principal covering of many thousands of square miles, and is known by the names of Dhob, Doorba, etc. It is also common in the south of Europe. It is introduced throughout the warmer parts of the world. Its creeping roots have medicinal virtues, and are sometimes used as a substitute for sarsaparilla. See BERMUDA GRASS.

CYNOGNATHUS, sī-nōg'nā-thūs (Neo-Lat., from Gk. κύων, *kyōn*, dog + γνάθος, *gnathos*, jaw). A large theriodont reptile found fossil in the Karoo formation, of Permo-Jurassic age, of South Africa. The skull, which has a length of 16 inches, is, in respect to its form and dentition, remarkably like that of the carnivorous mammals, and recalls that of a wolf. The vertebrae, which are 29 in number, are amphicelous, and the ribs have double articulations. It is perhaps one of the reptiles which have given rise to some of the early mammals. See THERIODONTIA.

CYNOSARGES (Lat. from Gk. κυνίσσαργες, *kyinosarges*, from κύων, *kyōn*, dog + ἀργός, *argos*, white). A place on the outskirts of ancient Athens, near the present site of the American and British schools of archaeology on Mount Lycabettus. It contained a number of temples and a gymnasium consecrated to Heracles, at which strangers with but one Athenian parent were obliged to exercise, recalling the semi-mortal parentage of Heracles. The philosopher Antisthenes is said to have taught here, and thence his school probably derived the name 'Cynic.'

CYNOSCEPHALÆ, sīn'ōs-sēf'ā-lē (Lat., from Gk. Κυνός κεφαλαί, *Kynos kephalai*, dogs' heads). The name of two hills in eastern Thessaly, ancient Greece, noted for two important conflicts. In the first the Thebans under Pelopidas defeated Jason, tyrant of Pheræ, B.C. 364; in the second the Romans, commanded by T. Quinctius Flaminus, defeated Philip V. of Macedon, B.C. 197.

CYNOSURE, sīn'ō-shōōr or sīn'ō-shōōr (Lat. *Cynosura*, Gk. Κυνόσουρα, *Kynosoura*, constellation of Ursa Minor, from κύων, *kyōn*, gen. sing. of κύων, *kyōn*, dog + οὐρά, *oura*, tail). The constellation of which the pole star is the principal star. Milton's lines in "L'Allegro"—

Where perhaps some beauty lies,
The cynosure of neighboring eyes—

have made the word popular; the metaphor is grounded on *Ursa Minor* being the constellation toward which the others look, as it were, and round which they wheel.

CYNOSURUS. See DOG'S-TAIL GRASS.

CYNTHIA (Lat., from Gr. Κυνθία, *Kynthia*). A surname of the moon-goddess Diana, from her birthplace, Mount Cynthus, on the island of Delos; and hence a poetic term for the moon. Queen Elizabeth is referred to under this name in Spenser's *Colin Clout's Come Home Again*, in Fletcher's *Purple Island* and in Raleigh's poem "Cynthia."

CYNTHIA MOTH. See AILANTHUS MOTH.

CYNTHIANA, sīn'thī-ā'nā. A city and county-seat of Harrison County, Ky., 33 miles north by east of Lexington; on the South Licking River and on the Louisville and Nashville Railroad (Map: Kentucky, G 2). It is the cen-

tre of a fertile agricultural region and is widely known for its manufactures of whisky. The government is administered under a charter of 1893, which provides for a mayor, elected every four years, and a municipal council. The city owns and operates the water-works. Population, in 1890, 3016; in 1900, 3257. On June 11, 1864, Gen. John Morgan, with 1800 men, captured Cynthiana, and, later in the day, defeated 500 Union cavalry under General Hobson; but on the 12th he was in turn defeated by General Burbridge with a force of about 5400, the Union army losing, in killed, wounded, and missing, 414 men, the Confederates about one-third of their number.

CYNTHIA'S REVELS. A conical satire by Ben Jonson, first acted in 1600.

CYNTHIUS (Lat., from Gk. Κύνθιος, *Kynthios*). A surname of the sun god, Apollo, from his birthplace, Mount Cynthus, in Delos.

CYPERACEÆ, sip'ē-rās'sē-ē or sī'pē- (Neo-Lat. nom. pl., from Lat. *cyperos*, *cyperum*, Gk. κύπερος, *kypeiros*, sedge), sometimes popularly called sedges. An order of monocotyledonous plants, akin to grasses, but having generally a triangular, solid stem, which is without joints, or almost so, and often leafless. The species are mostly perennial, growing from sympodial rhizomes. The leaves are sometimes sheathing, when they are 3-ranked, but their sheaths are always entire, not split, as in the grasses. The flowers, which are hermaphrodite in some and unisexual in others, consist of a scale-like glume within which lie the organs of fructification, the pistils alone being frequently inclosed in a separate urn-shaped covering; the place of the perianth is sometimes supplied by a few bristles. The stamens are one to three in number, the anthers erect; the ovary is one-seeded, the style single, trifid or bifid; the fruit a small crustaceous or bony nut or achene, not adhering to the pericarp. Plants of this order, which contains fully 60 genera and 2500 known species, occur in all zones; some of the genera, as *Carex*, abound in the colder, some, as *Cyperus* (q.v.), in the warmer parts of the world. Many of them are plants of very humble growth, some, as bulrushes, papyrus, etc., comparatively large, but none rival in size the gigantic grasses, e.g. bamboos. Most of them grow in marshy and moist places, but a few in sunny, dry places. Their stems and leaves are somewhat deficient in succulence, and in most of them also very rough, so that they are eaten by domesticated cattle only when in a very young state, and then rather from necessity than from choice. They are regarded by farmers as mere weeds. Much of the so-called 'marsh hay' is composed of various species of this order. Pax divides the order into two groups, Scirpoideæ, with *Scirpus*, *Cyperus*, *Eriophorum*, *Eleocharis*, and *Fimbristylis* as the principal genera; and Caricoideæ, the chief genera of which are *Carex*, *Schömus*, and *Rhynchospora*. Aside from the references given above, the members of this order are of little economic importance. See **CYPERUS**; **SCIRPUS**; **BULRUSH**; **COTTON-GRASS**; **PAPYRUS**.

CYPERUS (Neo-Lat., from Lat. *cyperos*, *cyperum*, Gk. κύπερος, *kypeiros*, sedge). A genus of plants of the natural order Cyperaceæ which contains a great number of species, chiefly tropical, and gradually decreasing in number toward

the colder parts of the globe. Many of the species have tubers or corms, which in some are mucilaginous and nutritious; others contain a bitter principle, and possess medicinal qualities. Of the latter class is *Cyperus longus*, or sweet cyperus, one of the species which is common in ditches and wet meadows in some parts of Europe, the rhizome of which has an odor of violets, and is astringent, tonic, and stomachic. It has been employed in medicine from very ancient times, but is now more used in perfumery. Some of the Indian species are also used medicinally and in perfumery in their native country, as well as species of kindred genera. Of those with esculent tubers, the most important is *Cyperus esculentus*. (See CHUCA.) A number of species are frequently grown as house plants, common among which are the umbrella plant or umbrella palm, *Cyperus alternifolius*, and *Cyperus papyrus*, formerly called *Papyrus antiquorum*, the Egyptian paper-plant. See PAPHYRUS.

CYPHEL. See HOUSE-LEEK.

CY-PRÈS, sè' prâ' (OF., as near). The principle of English and American law whereby a testamentary gift which cannot take effect in the precise manner intended by the testator is given an effect as nearly as possible like that which was intended. The doctrine has been applied in two classes of cases.

In the Creation of Fee-tail Estates.—It is an established rule of real property law that a gift of land by way of remainder to the issue of an unborn person is void if it follow a gift of a life estate in the same property by the same instrument to such unborn person himself. But if the gifts be made by will, the remainder to the issue may be saved by construing the life estate of such unborn person as a fee tail, in which case it is capable of descending to the issue as tenant in tail. See FEE TAIL; ESTATE.

In Charitable Gifts.—Where the object of a charitable gift fails, as by the dying out of the entire class of persons intended as beneficiaries of the charity, or where a charitable gift might be void in consequence of the indefiniteness of the charity or the operation of the rule against perpetuities, the court of chancery may direct the application of the property to another or to a specific charity. Thus, in the first case, a testamentary gift for the emancipation of slaves in the United States might, after the abolition of slavery, be devoted under the cy-près doctrine to the education of emancipated slaves; and, in the second case, a charitable gift for the benefit of the American Zionist Society—there being no such society in existence and there being a possibility that it may not come into existence within the period fixed by the rule against perpetuities—may be applied to the purposes which the testator had in mind, through the agency of any other society having similar aims and competent to make a beneficial disposition thereof.

It is in cases of charitable gifts that the cy-près doctrine finds most of its applications in the United States. It has been repudiated in several of the States, but in most of them it exists, and in New York, where it has for many years been in abeyance, it has recently been revived by statute. It is generally considered a salutary doctrine, as tending to preserve to charity a gift clearly intended for benevolent pur-

poses, and as effectuating the general intention of the testator, even though the particular intention entertained by him cannot be carried into effect. See CHARITABLE TRUSTS; PERPETUITIES; TRUST; INTERPRETATION; WILLS; and the authorities there referred to under those titles.

CYPRESS (Fr. *cyprès*, Lat. *cupressus*, Gk. *κυπάρισσος*, *kyparissos*; connected by some with Heb. *gopher*, a sort of tree, Assyr. *giparu*, reed, canebrake). Evergreen trees and shrubs of the genus *Cupressus*, and of the natural order Conifera. They have small, generally appressed and imbricate leaves and globular cones of a few thickened scales. There are about a dozen species, natives of Europe, Asia, and the western part of North America. One of the best known is the common cypress of the south of Europe (*Cupressus sempervirens*), and introduced into England and parts of the United States, a tree which attains a height of 80 feet, and is famous alike for the great age it reaches and for the durability of its wood. The wood is red or yellowish, hard, compact, and durable. It is not subject to attacks of insects and was once in great demand for cabinet work. It is believed to be the cedar wood of Scriptures and possibly the gopher wood also. Museum specimens of the wood are known to be several thousand years old, and the old doors of Saint Peter's at Rome lasted for more than 1100 years until replaced by doors of bronze. Medicinal virtues were once attributed to the wood, but its present use is for cabinet work and musical instruments. Perhaps the finest tree of this genus is *Cupressus macrocarpa*, the Monterey cypress of California. It is a beautifully symmetrical tree, attaining a height of 150 feet and a circumference of trunk of eight to ten feet. It grows rapidly, even on poor soils, and thrives best near the sea. It is not very hardy; freezing temperatures are fatal to it. A small tree (*Cupressus Macnabiana*) of California is much hardier. *Cupressus funebris*, of China, has wide-spreading and often pendulous branches; it attains a height of 60 feet, and has been extensively planted as an ornament in regions adapted to it. *Cupressus lusitanica* is common ornamentally in the south of Europe, where it is known as cedar of Goa. *Cupressus torulosa* is a valuable species found in the north of India. *Cupressus obtusa* or *Retinospora obtusa*, a Japanese species, is hardy, attains a height of 100 feet, has a hard, close-grained, durable wood, which is considered of great value in Japan, where the tree is abundant in the forests. It is hardy in the latitude of New York, and some of its varieties are of great beauty. Other species occur in Japan, Mexico, and the United States. By some botanists the species of *Chamaecyparis* are united with *Cupressus*. Among the best known are the white cedar (*Cupressus thyoides*) of the eastern United States, the yellow cedar (*Cupressus nootkanensis*), and Port Orford cedar (*Cupressus Lawsoniana*), all of the Pacific Coast region. The bald or southern cypress (*Taxodium distichum*) is a tall tree with deciduous leaves which occurs abundantly in the swamps from Maryland to Missouri and south to the Gulf of Mexico. The timber of this tree is valuable for many purposes. It works easily and is commonly used for shingles. In water it is very durable. When growing in wet places curious, conical, hollow upward growths, called knees, rise from the roots. Their function

CYPRESS, ETC.



1. MONTEREY CYPRESS (*Cupressus macrocarpon*).
2. BROOM (*Cytissus scoparius*).
3. CUBEBS (*Piper cubeba*).

4. AN ORNAMENTAL CROTON (*Croton Cooperi*).
5. RED CURRANTS (*Ribes rubrum*).
6. NUT GRASS (*Cyperus rotundus*).

is not positively known. The tree will grow in dry places, and is frequently planted as an ornament as well as for its timber. For illustration of a California cypress-tree, see *PLATE OF CYCADS AND CYPRESS*. For fossil forms of cypress, see *CONIFERÆ*.

CYPRESS SWAMPS. Swamps of the southeastern United States in which the bald cypress (*Taxodium distichum*) is one of the dominant trees. See *SWAMPS*.

CYPRESS-VINE. See *IPOMŒA*.

CYPRIA (Lat., from Gk. *Κύπρια*, *Κύπρια*, from *Κύπρος*, *Κύπρος*, Cyprus). The title of a poem once ascribed to Homer, but declared by Herodotus not to be his, and later attributed to Stasinus or Hegesias. It relates the causes leading to the Trojan War, and so is a sort of preface to the *Iliad*.

CYPRIAN. A name sometimes given to a courtesan as being a follower of Venus, the Cyprus-born goddess of love.

CYPRIANUS, or CYPRIAN, THASCIUS CECILIUS (? -258). The great leader of the early African Church. He was born in North Africa, probably not in Carthage, though at the time he first comes into notice he was living there in the luxurious style of a man of large wealth. His training had been in the law, and he had attained prominence as a teacher of rhetoric. Up to 246 he had been a pagan. Then he applied for admission to the Christian Church as a catechumen, and after instruction was baptized. Such a man was a great gain to the Church. He early gave evidence of his piety and desire to throw in his lot with the Christians by voluntarily parting with his property and giving the proceeds to the poor. In 247 he was made a presbyter, and in 248 Bishop of Carthage. He owed his rapid elevation to his high character, his noteworthy gifts of administration, and to the promise he gave of being a devoted leader. These hopes he did not belie. No sooner had he become accustomed to the duties of his high office than the peace which the Church had enjoyed for many years was broken by the sudden exhibition of zeal for the old faith on the part of the Emperor Decius. By the imperial decree of 249 Christianity became a forbidden religion; its profession meant confiscation, torture, exile, even death, and bishops had a price set upon their heads. Not from cowardice, but from the conviction that it was better for him to continue to guide his flock, which he thought he could do just as well out of Carthage as in it, in January, 250, he went into retirement; not exactly concealment, because it must have been easy for the authorities to find him if they wished. Thus he lived fourteen months, and then as calmly returned to Carthage. His time had been well spent, and the fruits of it appear in his preserved correspondence and treatises. But when once more in the city he saw for himself the desolation the persecution had caused. Many had denied the faith, or pretended to do so, many had abandoned their homes, many had died. The more pressing question related to the treatment to be accorded the 'lapsed,' whom he treated sternly and commanded to repent and show contrition; then he would receive them. (See *LAPSED*.) He had indeed dealt with the matter while in retirement, but now he must take a more decided stand. In March, 251, he

held his first council at Carthage, and there he met the internal foes, who had greatly increased during his retirement, and was compelled to yield some points. The relation between the Bishop of Rome and the Bishop of Carthage is the most interesting point. Cyprian treats Stephen, the bishop of the former, as an equal, and they differ upon the important matter of the reception into the Church upon their renunciation of heresy of those who had been baptized by heretics. Stephen—and this was the Roman and ultimately the general position—did not re-baptize such, while Cyprian did. The controversy between these bishops was sharp and even acrimonious. Stephen called Cyprian a pseudo-Christian; Cyprian called Stephen a schismatic.

The episcopate of Cyprian was indeed a troubled one; heretics, schismatics, feeble, timid Christians, scheming, ambitious leaders, and, to add to the turmoil, the horrors of pestilence—all these must have greatly worried the Bishop. But he did much to strengthen the episcopate as an institution, and make Church councils part of the regular machinery of the Church. These two services entitle him to everlasting remembrance. He held seven councils, the last in 256. But the end which he had long anticipated was very near. In August, 257, persecution once more broke out, this time under Valerian, the successor of Decius, and Cyprian was apprehended. He was treated with the utmost tenderness, for manifestly the officers were discharging a very disagreeable duty. He was brought before the proconsul (August 30, 257), required to sacrifice to the gods, and on his refusal banished to Curubis, a free town near the sea (modern Xurbo), 50 miles southeast of Carthage. There he lived, attended by many friends and active in his episcopal duties, for eleven months, when he was recalled to Carthage and lived for a while in his own home. On September 13, 258, he was again arrested, brought before the consul, sternly questioned, and sentenced to death. "Our pleasure is that Thascius Cyprianus be executed by the sword;" to which Cyprian only said, "Thanks be to God." On September 14 the sentence was carried out.

The writings of Cyprian are most interesting and handle a great variety of topics. The eighty-two letters are the most important, but the treatises on the "Unity of the Church," the "Dress of Virgins," the "Lapsed," the "Lord's Prayer," the "Vanity of Idols," "Against the Jews," and others are very instructive. The best edition of his writings is by G. Hartel (3 vols., Vienna, 1868-71); there is an English translation in *The Ante-Nicene Fathers*, vol. v. (Buffalo, 1886-96). Consult A. Harnack, *Drei wenig beachtete Cyprianische Schriften und die Acta Pauli* (Leipzig, 1899); and for his life consult E. W. Benson (London and New York, 1897).

CYPRINE, *sīp'rīn* or *-rīn* (Lat. *cyprinus*, *cuprinus*, from *cuprum*, copper). A name given to a pale sky-blue or greenish-blue variety of vesuvianite. Its color is said to be caused by a small amount of copper, whence its name.

CYPRINIDÆ (Neo-Lat. nom. pl., from Lat. *cyprinus*, Gk. *κυπρίνος*, *kyprinos*, carp). A family of soft-rayed fishes inhabiting the fresh waters of North America, eastern Asia, and Africa. The head is naked, and the body, with a

few exceptions, is covered with cycloid scales. The mouth bears no teeth, but the pharyngeal bones bear from one to three series of teeth, with a maximum of seven teeth in the main series. There are about 200 genera and 1000 species. They are usually very numerous in individuals. With exceptions like the goldfish, they are not highly colored. The males often differ from the females during the spawning season, not only in additional colors, but in the growth of tubercles on the head, fins, and other parts of the body. The family includes such familiar fish as the chub, dace, carp, tench, bleak, bream, barbel, minnow, goldfish, roach, loach, etc. Most of the North American species are small, under 12 inches in length. The Old World forms and some of the Pacific Coast species grow to a much larger proportion, and are often important as food. All important kinds are described elsewhere under their English names. See *CARP*.

CYPRINODON'TIDÆ (Neo-Lat., from Gk. *κυπρίνος*, *kyprinos*, carp + *ὀδός*, *odous*, tooth). A large family of soft-rayed fishes closely related to the Cyprinidæ (q.v.), with which they were formerly placed. The body is elongate, compressed behind and usually depressed at the head, and both are covered with rather large cycloid scales. The mouth is small, extremely protractile, and provided with small teeth; the lower jaw usually projects, and the pharyngeal bones are not armed, as in the Cyprinidæ. The sexes are usually unlike, and some of the species are viviparous. In these the anal fin of the male is modified into an intromittent organ. The species are numerous, but none attains a large size, and some are extremely small. They inhabit the fresh-water streams, brackish waters and bays of America, southern Europe, Africa, and Asia. The family includes the top-minnows, mummichog, killifish, etc., and the interesting anableps, or four-eyed fish. Many of the species are extremely resistant and have become adapted to very diverse habitats. See *MINKOW*; and *PLATE OF KILLIFISHES AND TOP-MINNOWS*.

CYPRIOTES, sîp'ri-ōts (from Lat. *Cyprius*, Cyprian, from *Cyprus*, Gk. *Κύπρος*, *Kypros*, Cyprus; Turk. *Kıbrıs*). Natives or inhabitants of Cyprus (q.v.). Since there appears to have existed at least as early as B.C. 4000 an indigenous civilization in the island of Cyprus, the creative and stimulative influences of which are discoverable all over the eastern Mediterranean, the relationship of its ancient inhabitants is a question of great importance. The idea that they were simply Semitic Phœnicians is being abandoned, since the civilization of the latter may very well have been derived from Cyprus, and not *vice versa*. Some of the latest authorities, like Ohnefalsch-Richter and Sergi, regard the autochthonous civilization of Cyprus as belonging, with the prehistoric Egyptian, to the Afro-Mediterranean or 'Afro-European' culture-centre, and its originators physically to the North African white race. Asiatic influence as such is later.

The literature about the Cypriotes and their culture is listed up to date in Cobham, *Bibliography of Cyprus* (London, 1900). The ethnological questions involved have been discussed by Ohnefalsch-Richter, in his article in the *Verhandlungen der Berliner Gesellschaft für Anthro-*

pologie for 1899, and by Sergi in his *Mediterranean Race* (London, 1901).

CYP'RIPE'DIUM. See *LADY'S-SLIPPER*.

CYPRUS (Lat., from Gk. *Κίπρος*, *Kypros*). One of the largest and most important islands in the Mediterranean, in the northeast of that sea, nearly equidistant from Asia Minor on the north and Syria on the east, 46 miles from the former, and about 50 miles from the latter (Map: Turkey in Asia, E 5). It is 145 miles long and 60 miles wide. Area, 3584 square miles. Cyprus formerly belonged to the Ottoman Empire, but since 1878 has been under British control. A great part of the island is occupied by two mountain ranges in a general direction of west to east. The loftiest, which fills the whole southern portion of the island, is called Olympus, a name applied by the ancients to one particular peak. The highest summit is that of Mount Troodos, about 6500 feet. The range terminates in the isolated peak of Oros Stavro, or Hill of the Holy Cross, a conspicuous object from Larnaka, and evidently the peak called Olympus by Strabo, although it is but 2300 feet high. The northern range is an unbroken ridge for 100 miles, inferior in elevation to the other, its highest summits not exceeding 3200 feet. Between these ranges is a broad plain extending across the island from the Bay of Famagosta to that of Morphu on the west, about 60 miles long and from 10 to 20 miles wide. This plain is called Messaria, and is watered by two streams. It is open, but little cultivated. It is bare of timber, and only the loftiest and central summits of the Olympian range retain their covering of pine woods. The climate varies in different localities; in the central plain and about Larnaka the heat is excessive, but is tempered by cool sea-breezes until about the middle of September, between which time and the end of October is the hottest period. The winter is short and cold, but snow is seldom seen except upon high mountain peaks. Fevers are prevalent during the warm months.

In ancient times Cyprus supplied the Greek monarchs of Egypt with timber for their fleets. It was also celebrated for its mineral wealth, especially for copper, a metal which takes its name (*cuprum*) from the name of the island. No copper-mines are now worked. There was also considerable silver produced, and Pliny says the precious stones were found there. Salt, for which the island was noted in olden times, is still produced in large quantities in the neighborhood of Larnaka and Limasol. Gypsum and terra-umbra are the chief minerals found. The principal vegetable productions are cotton, wines, and fruits; some tobacco is grown. Cultivation is easy and the soil in many places is exceedingly productive, particularly at the foot of Mount Olympus, and along the level land of the northern shore.

Drainage and the planting of trees has greatly benefited the least healthful regions. Agriculture and manufactures, formerly in a backward state, have made considerable progress since the island came under British rule; according to current estimates about two-thirds of the arable land is under cultivation. The success of the crops depends on irrigation, which is chiefly effected by means of wells. The rivers are short and variable in volume, depending for their water

on the rains and the melted snow from the mountains. During the hot season they present only dried-up watercourses. The formation of the coast-line is unfavorable to commercial development, as there are practically no good harbors. The chief places of trade, Larnaka and Limasol, have only roadsteads; and Salamis, which was the chief port of antiquity, and Famagosta, which held that position under the Venetians, are only artificial harbors on an open sandy coast. The English early selected Famagosta as the most favorable place to construct a good harbor. The towns in Cyprus worthy of notice are: Lefkosia, commonly called Nicosia, which since the time of the Lusignan kings has been the capital of the island, and which has a population of over 12,500; Famagosta, on the eastern coast near the ruins of Salamis, important under the Venetians, but now having only a few hundred inhabitants; Lanarka, on the southeast coast on the site of the ancient Citium, now the chief place of trade, with 7000 or 8000 inhabitants; Limasol, on the southern coast, some distance west of the site of Amathus, the chief point for the export of wines; and Baffo, or Papho, on the site of the ancient Paphos, in the southwest. In 1871 Nicosia was brought into telegraphic communication with the rest of the world by means of a submarine cable to Latakia on the Syrian coast, and this line was subsequently extended to Larnaka; there is also communication by cable with Alexandria in Egypt. There are several hundred miles of telegraph lines and good roads. The commerce of Cyprus is comparatively unimportant, the average annual value of 1895-99 reaching but \$2,735,000, the imports generally exceeding the exports. Among the chief exports are raisins, cocoons, wines, wheat and barley, wool, carobs and flour; the chief imports are cotton and woolen manufactures, tobacco, groceries, rice, alcohol, iron, leather, petroleum, timber, sugar, soap, and cotton manufactures. The sponge-fisheries yield products valued at between \$100,000 and \$150,000 per annum.

By treaty between the British Government and the Ottoman Empire, June 4, 1878, Asiatic Turkey was placed under British protection, and permission was given to England to occupy Cyprus. Sir Garnet Wolseley was appointed Governor, and was installed as administrator, July 23. The head of the administration is the High Commissioner, who is assisted by an executive council consisting of three office-holders, and a legislative council of eighteen members, one-third of whom are office-holders; the rest are elected on a property qualification, three by the Mohammedan and nine by the non-Mohammedan population. The municipalities are administered by elected councils. Education is to some extent controlled by the Government, and is chiefly of an elementary character. The total number of schools in 1899 was 408, of which 339 were in receipt of some aid from the Government, while the rest were maintained by endowments or private contributions. The total enrollment in all the schools was a little over 19,000, of which number 4300 were Moslems. Justice is administered by a supreme court, assize, district magistrate, and village courts, all of them with the exception of the first having natives for judges. For administrative purposes Cyprus is divided into the six districts of Nicosia, Larnaka, Lina-

sol, Famagosta, Papho, and Kyrenia. The chief sources of revenue are tithes, which are paid in kind, taxes on property, salt monopoly, and customs. The revenue shows an increase from £167,777 (\$838,885) in 1895-96, to £200,638 (\$1,003,190) in 1899-1900, while the annual grant from Great Britain shows a decrease from \$230,000 in 1896-97 to \$65,000 in 1899-1900. The currency consists of English, Turkish, French, and native coins. The weights and measures are Turkish.

The population, in 1891, was 209,286, of whom three-fourths were Greeks, 47,928 being Mohammedans; in 1901 it was 237,022, including 51,309 Mohammedans.

The early civilization of the island is known only from the excavations of recent years, which have thrown little light on the ethnic affinities of the primitive inhabitants. (See CYPRIOTES.) There are but scanty traces of the Stone Age, but the Bronze Age, both in the earlier period when pure copper is used and in the later period after the introduction of tin, is characterized by a well-developed and clearly marked civilization, presenting close analogies to that represented in the lower strata at Troy. The people seem to have been pastoral, and to have avoided the mountains and forests. They early learned to work the rich copper-mines of the island, and seem to have been somewhat in advance of their neighbors in Syria and on the islands of the Ægean. From its situation, Cyprus was exposed to foreign influences, and seems to have served as intermediary between Egypt and Syria and the Mycenaean civilization of the West. The Mycenaean civilization seems to have reached the island about B.C. 1600 and to have continued for about 800 years. Whether it was introduced by Greek colonists is uncertain, but these colonists certainly came to the island before the Dorians had occupied Peloponnesus, and before the introduction of the later Greek alphabet; for they spoke a dialect closely akin to that of the Arcadians, and used a clumsy syllabic mode of writing, which seems akin to that of southern Asia Minor and possibly of Crete. The Greek and Phœnician settlements belong to the Iron Age; the latter are found chiefly along the southern coast, where they remained predominant in Citium, Amathus, and Marion even in later times. The Greeks at first settled along the northern shores and at the eastern and western extremities of the great plain which crosses the island at Amathus, Salamis, Soli, and later predominated in Paphos, Citium, and Lapathus. Whether the worship of Aphrodite, which flourished greatly in Cyprus, developed from that of a nude nature-goddess of the original inhabitants or from that of the Phœnician Astarte is uncertain, but it reached the greatest splendor and sensuality among the Greeks, who regarded Cyprus as the favored spot where the goddess was born from the sea-foam. The island was invaded by Thothmes III. of Egypt, and in the eighth century before Christ was tributary to the Assyrians. In the sixth century it was conquered by Amasis of Egypt, and on the conquest of that kingdom by Cambyses, passed under Persian rule. The Greeks of Cyprus joined in the Ionic revolt, but were conquered, and Cypriote vessels were in the fleet of Xerxes. The attempt of Cimon to join Cyprus to the Athenian League was unsuccessful, and

the island remained tributary until Evagoras (q.v.) became King of Salamis (B.C. 410-374), made himself master of much of the island, and nearly succeeded in casting off the Persian yoke. After the battle of Issus, when Alexander advanced into Phœnicia, all the cities of Cyprus declared in his favor, and sent ships to assist him in the siege of Tyre. Under the Persian rule the cities had been allowed a large measure of self-government under the control of kings, who seem to have claimed descent from heroic ancestors. After the death of Alexander, the possession of this island, so important for its seemingly inexhaustible forests (it is now quite bare of trees), became an object of contention among his successors, being especially sought by Antigonus and Ptolemy. It finally passed into the hands of the latter and was for a long time a valued dependency of Egypt. In B.C. 58-57 the tribune Clodius proposed and Cato effected its annexation by Rome. Under Augustus it was made a proconsular province, and from this time is scarcely mentioned in ancient history. Cyprus is noticed in Acts iv. 36, where it is mentioned as the native place of Barnabas; and in Acts xi. 19-20 it appears prominently in connection with the earliest spreading of Christianity. During the reign of Trajan (A.D. 116) it was the scene of a rising of the Jews, who are said to have killed 24,000 of the other inhabitants. After the division of the Roman Empire, Cyprus passed under the Byzantine emperors. In 646 the Arabs became masters and destroyed the city of Salamis. Two years later the Greeks recovered sway; but in 802 it was again conquered by Harun-el-Rashid, who was soon compelled to relinquish it to the Byzantine rulers. In 1184 Isaac Comnenus made Cyprus an independent sovereignty. In 1191 Richard of England ejected Comnenus, and in 1193 put Guy de Lusignan in possession as compensation for the loss of Jerusalem, of which Guy had been appointed king. For three centuries, under this dynasty, the feudal system flourished in Cyprus, the cities of Nicosia and Famagosta were adorned with churches, splendid even in their ruins, and the island seems to have been rich and prosperous. Through the Venetian Catarina Cornaro, the wife of James II., the Republic of Venice came into full possession of the island in 1489 and held the rule for about eighty years. In 1570 the Turks invaded Cyprus, quickly subdued the country districts, took the capital (Nicosia) after a siege, and murdered 20,000 of its inhabitants. Famagosta held out for a year and then made a capitulation, which was immediately violated by the Moslem general, who slowly tortured to death the governor of the city. From that period Cyprus continued a part of the Turkish Empire. In 1878 it was placed under English control by a treaty, which recognized the sovereignty of the Sultan, and assured him an annual income of £92,746. In 1882 a new constitution was promulgated, and under English rule the prosperity of the island has greatly increased. The antiquities of the island have been the subject of much unscientific and inaccurate exploration, conducted chiefly for the purpose of obtaining booty. Of these earlier excavations the most productive were those of L. P. di Cesnola, whose collections are for the most part in the Metropolitan Museum in New York. Later excavations in the modern scientific

method have been conducted by the Cyprus Exploration Fund, the British Museum, Ohnefalsch-Richter, and others.

BIBLIOGRAPHY. Unger and Kotschy, *Die Insel Cypern ihrer physischen und organischen Natur nach*, etc. (Vienna, 1865); Sassenay, *Chypre, histoire et géographie* (Paris, 1878); de Mas Latrie, *L'île de Chypre* (Paris, 1879); Lang, *Cyprus* (London, 1879); Baker, *Cyprus As I Saw It* (London, 1879); Fyler, *Development of Cyprus and Rambles in the Island* (London, 1899); Mariti, *Travels in Cyprus* (Nicosia, 1896); Cobham, *An Attempt on a Bibliography of Cyprus* (Nicosia, 1893); Engel, *Cyprus* (Berlin, 1841); Cesnola, *Cyprus: Its Cities, Tombs, and Temples* (New York, 1878); id., *Salamina* (London, 1882); *A Descriptive Atlas of the Cesnola Collection* (New York, 1885); Perrot and Chipiez, *Histoire de l'art antique*, vol. iii. (Paris, 1884; English translation by Armstrong, London, 1885); Ohnefalsch-Richter, *Cyprus, the Bible, and Homer* (London, 1893); Myres and Richter, *Catalogue of the Cyprus Museum* (Oxford, 1899); the inscriptions in the Cypriote dialect are published in Collitz, *Sammlung der griechischen Dialekt-Inschriften*, vol. i. (Göttingen, 1884); Schmidt, *Sammlung kyprischer Inschriften in epichorischer Schrift* (Jena, 1876).

CYRANO DE BERGERAC, sé'rá'nó' de bār'zh-rák'. See BERGERAC.

CYRENAICA (Lat., from Gk. Κυρηναία, *Kyrēnaia*). The name of the district whose capital was Cyrene (q.v.). It comprised the tableland on the north coast of Africa from the Great Syrtis to the promontory of Ardanis (Rās el-Mellah), though its boundaries fluctuated according to the degree of subjection in which the neighboring tribes were held. This plateau of Cyrenaica was, and still is, one of the loveliest and most agreeable regions of the world. The climate is delicious, mountains on the south sheltering the land from the scorching blasts of the Sahara, and cool sea-winds fanning it on the north. From the central plateau, whose breadth is about 80 miles, the land slopes down in verdant terraces to the Mediterranean. These terraces are cut and watered by mountain streams, forming luxuriant ravines. The productions of Cyrenaica mentioned by ancient writers are wheat, oil, wine, honey, fruits of all kinds, cucumbers, truffles, cabbage; flowers yielding the richest perfumes; and a rare plant called *silphium*. The country was also celebrated for its breed of horses, but was much exposed to the ravages of locusts.

The chief cities of Cyrenaica were Cyrene, Taucheira (afterwards called Arsinoë), Hesperides (afterwards called Berenice), Barca, and Apollonia. To each of these five cities (whence in the time of the Ptolemies Cyrenaica was named Pentapolis and Pentapolitana Regia) a certain amount of territory was attached. This favored their individual independence; and the consequence was that the dynasty of Battus, who led the first Greek colony to Cyrene (q.v.), exercised very little influence over Cyrenaica in general. After the death of Alexander the Great, Cyrenaica became part of the Egyptian kingdom of Ptolemy Lagi, and in the second century B.C. a separate kingdom under a branch of the Ptolemaic family. In B.C. 96 it was bequeathed to the Romans by Apion, the last king,

and shortly after was united with Crete as a Roman province. It continued to prosper for some time, but with the increasing weakness of the Eastern Empire, to which it belonged, was more and more exposed to the encroachments of the desert tribes, and in A.D. 647 was overrun by the Arabs. Ancient Cyrenaica nearly corresponds to modern Barca (q.v.).

CYRENAIC SCHOOL. A school of philosophy established by the followers of Socrates upon his death. Aristippus of Cyrene, its founder, taught that pleasure was the highest good, thus developing one side of the Socratic teaching to the exclusion of all others. Virtue for this school meant the course of life that secured the greatest enjoyment. For this, wisdom is necessary, since the pursuit of pleasure, prompted by instincts and impulses as they arise, often defeats itself. The wise man is the man who knows how he can obtain the maximum of enjoyment and who acts upon this knowledge. This doctrine received various modifications according to the view its adherents took as to the way in which the hedonistic end is attainable. Thus Theodorus insisted that in the form not of the pleasure of the moment, but of enduring joy or 'cheerful frame of mind,' can true satisfaction be obtained; Hegesias urged that an excess of pleasure over pain is unattainable, hence the true end of human endeavor is to minimize the discomforts of life, and he carried this doctrine to its logical outcome, that death is preferable to life; hence he was called the 'recommender of death.' This is perhaps the earliest appearance of pessimism (q.v.) in Occidental philosophy. On the other hand, Amieeris maintained that in the search for pleasure the friendly, social, filial, patriotic man is most highly successful, and thus went far toward carrying egoistic hedonism beyond its most obvious limitations. The Cyrenaic school was the precursor of the Epicurean (q.v.). Consult Watson, *Hedonistic Theories from Aristippus to Spencer* (Glasgow, 1895), and the authorities referred to in the article on ETHICS. See ETHICS; HEDONISM; UTILITARIANISM.

CYRENE, *si-rē'nē* (Lat., from Gk. *Κυρήνη*, *Kyrēnē*). In ancient geography, the capital of Cyrenaica, in northern Africa, situated about 10 miles distant from the coast and 1800 feet above the level of the sea. It is said to have been founded in B.C. 631, by Battus and a body of Dorian colonists from the island of Thera. It carried on an extensive commerce with Egypt and Greece, and was the birthplace of many distinguished men—the philosophers Aristippus and Carneades, the poet Callimachus, the astronomer Eratosthenes, the rhetorician and Bishop Synesius.

CYRIACUS, or **CIRIACO DE' PIZZICOLLI** (1391-c.1449). One of the most diligent antiquarians of the Renaissance in Italy. He was born at Ancona. Possessed from boyhood by the spirit of exploration, he early entered upon the life of a merchant, which enabled him to gratify his passion for travel. Led by his admiration for Dante to Vergil, and thence to Homer, he turned to the study of the classics, and devoted his travels to the enthusiastic study and description of the remains of the past. Unlike most of the Italian scholars of his time, he did not confine himself to the monuments of Italy. He visited

Syria, Egypt, the islands of the Aegean, and finally Athens and the mainland of Greece, everywhere purchasing manuscripts, coins, and works of art, copying inscriptions, sketching and describing roads, walls, buildings, and any other evidences of the life of ancient Greece. His notes and drawings were collected in three large folio volumes, but after his death, which occurred about 1449, they became scattered, and now are known only by fragments or partial copies. Though Cyriacus never became a learned man, and often made ludicrous mistakes, his breadth of interest and untiring zeal led him to copy much that others neglected, and to him we owe our knowledge of many inscriptions and monuments which have since disappeared. Consult: Voigt, *Wiederherstellung des klassischen Altertums*, vol. i. (Berlin, 1893), where the earlier literature is cited; also Jahn, "Cyriacus von Ancona und Albrecht Dürer," in *Aus der Altertumswissenschaft* (Bonn, 1868).

CYRIL, *si-ril* (Lat. *Cyryllus*, Gk. *Κύριλλος*, *Kyryllos*), **SAINT** (?-444). A bishop of Alexandria, one of the most energetic but least amiable of the Church Fathers. He was born in Alexandria, but the date of his birth is not known. He was educated in the desert, 65 miles south of Alexandria, by the cenobitic monks of Nitria, with whom he lived for five years, and who probably inspired him with that fiery, intolerant, and impetuous zeal which characterized him through life. Subsequently he went to Alexandria, where he became a presbyter, and on the death of his uncle, Theophilus, A.D. 412, obtained the episcopal see. The Alexandrian Jews, who were numerous and riotous, were the first to feel the effects of his inflexible character. Some Christian blood having been shed by them in a city tumult, Cyril put himself at the head of a rabble of zealots, attacked the Jewish quarter of Alexandria, destroyed the houses, and banished the inhabitants. Orestes, the Prefect of Egypt, having drawn up an accusation against Cyril, was attacked in the streets by 500 monks, who had come up from the deserts of Nitria, at the call of their old companion, ready to defend him against his foes. One of these monks having fallen in the skirmish, his corpse was carried in procession to the high church of Alexandria, where Cyril delivered a sanguinary discourse, gave the dead monk the name of Thaumasius ('the excellent'), and pronounced him a martyr and a saint. The violent death of Hypatia (q.v.), the famous woman philosopher of Alexandria, at the hands of a mob, has often been laid to the charge of Cyril, but perhaps all that can be justly alleged against him on this count is that he was in great measure responsible for the riotous conditions which led up to this deplorable event. But the most important historic event in his career was his controversy with Nestorius (q.v.), whose doctrines were condemned by the Council of Ephesus, presided over by Cyril (431). All the sternest features of his disposition appeared in this contest. In the midst of disquietudes, which he himself had largely occasioned, he died June 9, A.D. 444. In the Greek Church his day in the calendar of saints is June 9, in the Latin Church January 28. Cyril's numerous writings consist of commentaries, treatises, homilies, epistles, etc. The best edition was published by Jean Aubert (Paris, 1638, reprinted in Migne, *Patrol. Græca*,

lxviii.-lxxvii.). Certain of his works have been published in critical editions by English scholars, among them his commentaries on Luke (1859), John (1872), Minor Prophets (1868), and *Five Tomes Against Nestorius* (1881). For his biography, consult Kopallik (Mayence, 1881). Charles Kingsley's brilliant romance *Hypatia* gives a view of Cyril tinged with the author's prejudices against monasticism.

CYRIL, SAINT (c.315-86). A bishop of Jerusalem and an eminent Church Father. He was born in Jerusalem about A.D. 315, and ordained a deacon in 334, a presbyter in 345, and, on the death of Maximus, in 351 was elected bishop of his native city. His metropolitan was the Arian bishop Acacius of Caesarea, with whom he was soon engaged in hot conflict concerning originally the rights of his office, but ultimately their differences of doctrine. Acacius accused Cyril before a council at Caesarea in 358, whose competency Cyril did not acknowledge, of selling the treasures of his church in a time of famine to feed the poor, and this Arianizing assembly undertook to depose him. He appealed to a larger synod, which was held at Seleucia (359), and was by it restored to his office; but once more, through the persevering hostility of Acacius, he was deposed by a council assembled in Constantinople in 360. On the death of the Emperor Constantius (361) he was again restored to his episcopate. Soon after his old enemy Acacius died, but Cyril was immediately involved in new difficulties, and after considerable strife was banished, by order of the Emperor Valens, in 367; nor did he return till the Emperor's death in 378. He died March 18, 386.

Cyril's writings are extremely valuable, not because of their vigor, profundity, or beauty, but on account of their theology. They consist of twenty-three treatises, eighteen of which are addressed to catechumens and five to the newly baptized. The former are for the most part *doctrinal*, and present to us in a more complete and systematic manner than the writings of any other father the creed of the Church; the latter are *ritual*, and give us a minute account of baptism, chrism, and the Lord's Supper. Their style is simple and unattractive. Cyril's works were published by A. A. Toutée, the Benedictine monk (Paris, 1720; Venice, 1761); they were reprinted in Migne, *Patrol. Græca*, xxxiii., and by G. C. Reischl and J. Rupp (2 vols., Munich, 1848-60; Eng. trans. by E. H. Gifford in *The Nicene and Post-Nicene Fathers*, 2d series, vol. vii., New York, 1894). Consult Delacroix, *Saint Cyrille de Jérusalem, sa vie et ses œuvres* (Paris, 1865).

CYRIL and METHODIUS. The apostles of the Slavs in the ninth century. They were brothers, and sprang from a respectable family living in the half-Slavic, half-Greek town of Thessalonica. Having been ordained priest, Cyril (whose name was properly Constantine) became secretary to the Patriarch of Constantinople, and later prominently connected with the anti-Jewish polemics. The latter interest it was which induced him to go forth, during the reign of the Byzantine Emperor Michael III., to evangelize the Khasars, dwelling by the Caspian Sea under a Jewish king who allowed Jews, Mohammedans, and Christians to live peacefully together. His labors were very successful, the Khan himself being among the

converts. At this time Methodius, his elder brother, was abbot of a famous monastery in Constantinople. The Duke of Moravia, Rostislav, having established an independent Slavic kingdom and driven out the German priests, applied to Constantinople for Christian teaching. The patriarch sent him Cyril and Methodius (864). Cyril invented the Slavic alphabet, and the brothers, assisted by a number of their pupils, completed their translation of the Holy Scriptures, which is in use to the present day among all Greek Catholic Christians (Russians, Bulgarians, and Serbs). Feeling the necessity of linking the Moravian Church to the power of Rome, the brothers, after three and one-half years of work, went to Rome. There they were cordially received and were ordained. The younger of the two brothers died February 14, 869, as monk in a monastery at Constantinople, where he had taken the name of Cyril. Methodius continued the work among the Slavs, but in Pannonia, not in Moravia. In 870 the Pope made him a bishop and in 873 archbishop. Supported by the Pope, he long kept up a constant fight with the German emissaries. He died at Wehlerad, April 6, 885. Consult: Ginzler, *Geschichte der Slavenapostel Cyril und Methodius* (2d ed., Vienna, 1861); Dümmler and Miklosich, *Die Legende vom heiligen Cyrillus* (Vienna, 1870); Goetz, *Geschichte der Slavenapostel Constantinus (Cyrillus) und Methodius* (Gotha, 1897); also *Vita Sancti Methodii*, ed. by Miklosich (Vienna, 1870). The *Apologia Moralis* ascribed to Cyril was published by Carter (Vienna, 1630).

CYRIL/LA (named in honor of Domenico Cirillo or Cyrillo, an Italian physician). An evergreen tree or shrub, of which there is but one species, leatherwood (*Cyrilla racemiflora*), found from the southern United States to Brazil. In the United States it occurs from North Carolina to Texas, and is hardy as far north as Philadelphia. It has bright green leaves, and white flowers in racemes. The species is variable, and under cultivation some of the varieties are very ornamental.

CYRIL/LIC ALPHABET. A method of writing invented by Cyril, apostle of the Slavs (see CYRIL; METHODIUS) between 855 and 863. It is based upon the Greek *uncials* of the eighth or ninth century, with the addition of some signs to represent sounds not found in Greek. It originally consisted of thirty-eight characters, to which ten more were added later. With some modifications, introduced chiefly by Peter the Great, it is the alphabet now used in Russia, Bulgaria, and Servia. Consult Taylor, *The Alphabet*, vol. ii. (London, 1899).

CYRIL LUCAR. See LUCARIS, CYRIL.

CYR/OPÆ/DIA (Lat., from Gk. Κύρου παιδεία, *Kyrou paidéia*, education of Cyrus), THE. The longest work of Xenophon, purporting to give a history of the early life and training of Cyrus the Great, but in reality an historical romance. Its elaborate scheme of government and education are Spartan rather than Persian, and the whole work is to be regarded as the exposition of an ideal government. The story of Abradatas and Panthea is the earliest specimen of the love romance.

CYRTOCERAS, sēr-tōs'ē-ras (Neo-Lat., from Gk. κυρτός, *kyrtos*, curved + κέρας, *keras*, horn).

A genus of curved tetrabranchiate cephalopods, of which fossil species are found in rocks of Devonian age. They have large laterally compressed or triangular curved shells, with sub-triangular or T-shaped openings. The camerae or chambers are very short, so that the septa are close together, and the siphuncle is large, ventral, or sub-ventral, and restricted at each septum so that in a longitudinal section of the shell it gives the appearance of a string of elongated beads. The genus *Cyrtoceras* formerly included a great variety of curved shells, most of which have been proved by Hyatt to belong to other genera and even other families from that which includes the type species. Consult: Hyatt, "The Genera of Fossil Cephalopods," *Proceedings Boston Society of Natural History*, vol. xxii. (Boston, 1884); von Zittel and Eastman, *Textbook of Palaeontology*, vol. i. (London and New York, 1900). See also CEPHALOPODA; ORTHOCERAS; NAUTILUS; NAUTILOIDEA. For illustration see Plate of CEPHALOPODA.

CYRUS. River in Transcaucasia. See KUR.

CYRUS THE GREAT, or **CYRUS THE ELDER** (c. 600-529 B.C.). The founder of the Persian Empire and conqueror of Babylon, whom Isaiah called the *anointed* of the Lord and his *shepherd* (Isa. xlv. 28; xlv. 1). The name of this monarch appears in Old Persian as *Kūruš*, in the Babylonian inscriptions as *Kūruš*, in Hebrew as *Kōreš*, and in Greek as *Kēpos*, whence Latin *Cyrus*. According to Herodotus, the name signifies *sun*; but there is some possibility, judging from the Neo-Elamitic, that its signification may have been *shepherd*, with which the Isaiah passage might be compared. The lineage of this great King we have on his own authority on a famous cuneiform cylinder discovered some years ago. (Consult *Journal Asiatic Society*, London, 1880). This was written in the Babylonian language, and is now among the treasures of the British Museum. In this Cyrus traces his royal claim through his father, Cambyses, and his grandfather, Cyrus, back to Teispes; the latter was the son of Achaemenes (q.v.), founder of the Achaemenian line. The ancestral home was Anshan, or Anzan, which is believed to have been a city or district of Elam (q.v.). However that may be, there can be no doubt that Cyrus was a Persian, and he is rightly so called in the Old Testament.

According to the cuneiform records of Nabonidus (*Nabū-nā'id*), Cyrus was a vassal of Astyages (*Ištaregu*), who is spoken of as King of the Medes, or again of the Scythians. There is good ground for believing that Cyrus was directly connected with this ruler by the ties of blood. Herodotus (i. 107ff) expressly states that Cyrus was the grandson of Astyages, whose daughter Mandane had been married to Cambyses, a Persian noble. The Greek historian has a number of interesting and highly colored legends to narrate regarding the fear of Astyages for the infant as his future vanquisher, with popular stories also regarding the fortunes of the youthful prince and his rapid elevation to power. Whatever value is to be placed on these picturesque accounts, there is no question that Cyrus's triumphant career began with his overthrow of Astyages and his final mastery of Media before the year B.C. 550. The conquest of the Median Empire opened the way for

further success, and Cyrus turned his victorious arms against Crœsus of Lydia, whom he vanquished B.C. 546. Asia Minor was thus brought practically under this ambitious ruler's sway.

The time had now arrived to strike a mighty blow against Babylon. Nabonidus, the King of that ancient capital, seems to have estranged himself from his subjects, and to have lost the favor of the priestly class. By preference he lived at Temä, or Tevā, and when the condition of affairs within Babylon itself became such as to call him back it was too late. The account of the fall of the city we can gather by combining the testimony of the cuneiform records with the biblical narrative and Herodotus. Internal factions seem to have been numerous; the Jews, who were in captivity in the city, apparently played a part. Babylon is stated to have fallen *without fighting* before the victorious hosts of Cyrus, and Nabonidus was utterly overthrown. Belshazzar of the Old Testament may have been Bel-sar-usur, the son of Nabonidus, who, according to the inscriptions, offered resistance to the advance of Cyrus's forces. The fall of the city itself occurred at the moment of the great Tamuz festival, July, 539, and it was actually accomplished by Cyrus's satrap Gobryas (Gubaru or Ugbaru of the inscriptions), who was in command of the advance army. Cyrus himself made his triumphal entry into the city in October, 539, and became King of Babylon. The famous cylinder above referred to records the inauguration of his rule. We know in general that his policy toward the conquered people was a most liberal one, and even though it may have fallen somewhat short, perhaps, of the enthusiastic hopes of a prophetic Isaiah, its ultimate influence and effects are undoubted as having contributed toward the restoration of the Jews from captivity. See BABYLON.

The ambition of Cyrus, growing with advancing years, led finally, it seems, to his own destruction. The vision which Herodotus tells us Astyages beheld in a dream of the figure of the youthful Cyrus adorned with wings that overshadowed all Asia seemed now on the eve of fulfillment. The great conqueror's dominions actually extended almost from the Hellespont to the Indus. But disaster was at hand. Cyrus engaged in an invading expedition against the Scythian hordes of the north (Herod. i. 204; Ammianus Marcellinus, 20, 6, 7, 40). In a battle against the Queen, Tomyris, Cyrus is said to have been slain. Ctesias (*Pers.* 6-8), however, states that Cyrus fell in battle against the Derbica, a tribe bordering on India. The year of his death was B.C. 530-529, and his age is given as seventy-one years. His body is said to have received a final resting-place at Pasargade. A tomb, now empty, still stands there surmounting a series of rising stone steps. Near by is a huge monolith slab that once bore his name; but this is broken and tumbled down, a monument, like the empty and lonely mausoleum, silently recording the fall of greatness.

In estimating the character of Cyrus, after we have considered all the accounts of him, we may judge him to have been not only a man of great personal power, but an ideal king. The Persians called him father (Herod. iii. 89, 160); the Jews looked upon him as their liberator; the Greeks admired his qualities as a ruler and legislator (*Æschylus, Pers.* 764-68); and Xenophon chose

him as the hero of his famous historic romance, the *Cyropædia*. Taken for all in all, his claim to be entitled Cyrus the Great, as history has crowned him, remains unchallenged with time. The best short account of Cyrus, with abundant references, is that of Justi, in Geiger and Kuhn, *Grundriss der iranischen Philologie* (Strassburg, 1897). Consult also Duncker, *History of Antiquity*, Eng. trans. (London, 1881). Passing mention may be made of Horner, *Daniel, Darius the Median, Cyrus the Great* (Pittsburg, 1901).

CYRUS THE YOUNGER (? -401 B.C.).

The second of the sons of Darius Nothus, or Ochnus, and Parysatis, familiarly known through Xenophon's *Anabasis*. When his elder brother, Artaxerxes Mnemon (q.v.), succeeded to the throne (B.C. 404), Cyrus conspired to deprive him of his crown and his life. The plot, however, being discovered, he was at first sentenced to death, but afterwards pardoned, through his mother's intervention, and was even restored to his dignity of satrap of Asia Minor. Here he employed himself in making arrangements for war against his brother, although he concealed his purposes to the very last. In the spring of B.C. 401 he left Sardis at the head of 100,000 Asiatics and 13,000 Greek mercenaries, under pretense of chastising the robbers of Persidia. Artaxerxes, being warned of Cyrus's perfidy, made preparations to oppose him, and the two armies encountered each other in the Plains of Cunaxa, between 60 and 70 miles from Babylon. Cyrus was defeated and slain, although the Greeks fought with the greatest courage, and even routed that portion of Artaxerxes's troops immediately opposed to them. The fortunes of the Greeks, on their retreat through the highlands of Kurdistan and Armenia in severe winter weather, are recorded by Xenophon in his *Anabasis* (q.v.). That historian represents Cyrus the Younger as endowed with every amiable quality.

CYST (from Gk. *κύστις*, *kystis*, bladder). A tumor containing one or more cavities, the contents of which are of a fluid or semi-fluid consistence. The cyst-wall is formed of connective and fibrous tissue, rarely of muscular fibres, and the inner surface of the cavity is lined with epithelium. Cysts are classified according to their mode of development. Some are found in glands and are due to an excess of the normal cell-secretion; others are caused by obstruction of the ducts through which the secretion naturally escapes. One class, known as dermoid cysts, are due to faulty embryonic development, and these at times contain hair, nails, or teeth. Occasionally solid tumors undergo cystic degeneration. Hydatid cysts are of parasitic origin, and occur most frequently in the liver. Besides these there are numerous other varieties depending upon the tissues in which they grow. Cysts vary in size from minute retention cysts on the face to the enormous tumors of the ovary, one of which is reported as weighing 116 pounds. Surgical interference is frequently required. See OVARIES; HYDATIDS.

CYSTIDÆA. See CYSTOIDEA.

CYS'TIN (from Gk. *κύστις*, *kystis*, bladder), $C_5H_7NO_2S_2$. An organic acid (amido-sulpholactic acid), allied to lactic acid and having the constitutional formula $HOOC(NH_2)(CH_2)_2C.S.S.C(CH_3)(NH_2)COOH$. It is the principal constituent of the urinary calculus known as

cystic calculus, from which it may be obtained by dissolving in ammonia and allowing the solution to evaporate, the cystin separating out in the form of characteristic colorless crystals, which are insoluble in water, alcohol, or ether.

CYSTITIS (Neo-Lat., from Gk. *κύστις*, *kystis*, bladder). Inflammation of the urinary bladder. Among the causes of cystitis may be mentioned injuries, exposure to cold, injection of irritating medicaments in treating the urethra, insertion of a dirty catheter when drawing off the urine, retention of fermenting urine, extension of inflammation from other adjacent tissues, or the presence of a calculus (q.v.). The inflammation is accompanied by chills, fever, some nausea, pain in the bladder, and a continual desire to urinate. The urine is generally cloudy, from mucus and pus, or bloody. In treating cystitis, heat should be applied to the abdomen, or the patient should take a hot sitz-bath; he should take large quantities of alkaline drinks, and rest in bed. In many cases it is necessary to wash out the bladder, and a variety of drugs are used, according to the exact nature of the symptoms.

CYS'TOCARP (Gk. *κύστις*, *kystis*, bladder + *καρπός*, *karpós*, fruit). A complex form of fructification developed in the red algæ as a result of the sexual act. See RHODOPHYCEÆ; ALGÆ.

CYSTOIDEA (Neo-Lat. nom. pl., from Gk. *κύστις*, *kystis*, bladder + *εἶδος*, *eidos*, form). A class of extinct echinoderms of the subphylum *Pelmatozoa* (q.v.), allied to the erinoids and blastoids, but differing from these chiefly in the irregular arrangement of the plates of the calyx and the imperfect development of their arms. In general appearance the Cystoidea resemble the erinoids, with the remains of which they are often found associated in the Ordovician and Silurian strata. The cystoid body was included in a case or 'calyx' of variable form, spherical, cylindrical, hemispherical, or discoid, which is made up of polygonal calcareous plates without regular arrangement. The calyx-plates seem to have been, in many early genera, loosely united to each other, so that they became easily dissociated after death of the animal. This explains the rarity of perfect individuals in the Ordovician rocks, where the fragments are often exceedingly abundant. Another characteristic is the presence of pores that perforate the plates and that are arranged in rhombic series. These pores are supposed to have been connected with the respiratory apparatus. The number of plates in the calyx is very variable, from 10 or 12 to over 100, and as a rule those forms with the largest number of plates show the greatest irregularity in their arrangement. In some of the forms, with less number of plates, these are arranged in regular transverse rows, and the calyx then approaches more nearly the aspect of the simpler forms of erinoids.

The arms are absent in many genera of cystoids, and when present are seldom found attached to the calyx. They are never pinnulated like those of the erinoids, though they are composed in a similar manner, and are often supplied with grooves. In those cystoids without free arms there is generally found on the ventral surface of the calyx a system of ambulacral furrows that radiate irregularly from the mouth-

opening. These furrows, representing the arms, are bordered by rows of small plates that often bear pinnules of delicate construction, as seen in *Callocystites*, *Glyptosphaerites*, and *Agelaerinus*. The more primitive cystoids have neither arms nor ambulacral furrows. The openings of the calyx are four in number. The mouth is central or subcentral on the upper or ventral surface; the anal opening is eccentric, and is generally closed by a pyramid of small, triangular plates; a third opening, often present near the anal opening and generally closed by triangular plates, is considered to be the genital orifice; and a fourth small, slit-like aperture, present in only a few genera, is of problematic nature. The calyx of the cystoid is usually elevated on a stem which often resembles that of the crinoid in being composed of a single series of plates pierced by a central canal. In some genera (as *Dendrocystites*) the stem is made up of plates arranged in transverse rows, and the central cavity is then much enlarged and continuous with the general cavity of the calyx. In *Echinospaerites* the stem is reduced to a tubercle on the dorsal surface, and the animal seems to have been a free living form. The discoid genera *Agelaerinus* and its allies are sessile, and are attached either by a pedestal or by cementation of the dorsal surface of the calyx to foreign objects, generally the shells of mollusks.

Classification of the Cystoidea is a matter of difficulty, not alone because of the general imperfection of the material, but also on account of the great diversity of structure seen within the class, which contains a number of synthetic or ancestral types that seem to have given rise to all the other more specialized groups of the Echinodermata. Through assumption of a more regular arrangement of the plates and the development of the arms, with consequent rearrangement of the ventral surface, as in *Cryptocrinus*, *Poroerinus*, and *Caryoerinus*, they gave rise to the Crinoidea. Reduction of the plates and enlargement of the ambulacral grooves, with the assumption of the pentamerous gemmiform shape, as in *Asteroblastus*, leads to the Blastoidea. *Agelaerinus* is suggestive of the star-fish (*Asteroidea*) and brittle stars (*Ophiuroidea*), and finally the Echinoidea and Holothuroidea may be imagined to have been derived from the more spherical forms of armless cystoids, the echinoids presenting a series of progressive evolution, the holothurians a regressive series.

RANGE. The Cystoidea is the oldest known class of echinoderms; their isolated plates, rarely united to give a clue to the form of the animal, known under the names of *Eocystites*, *Protocystites*, etc., from the Cambrian rocks, are the earliest representatives. The class enjoyed two periods of expansion. First, in the early Ordovician time they flourished in hosts in some regions, their remains forming the larger part of certain limestones, such as the lower Chazy limestones of Lake Champlain. Other limestones, of Beekmantown and Trenton age, in the Saint Lawrence and Champlain valleys, and beds of equivalent age in the Baltic provinces of Europe, contain abundant cystoid remains. The second expansion of the class occurred during the Silurian time, when these creatures lived in abundance in some portions of the seas of northern and middle Europe and eastern North America. In all about 250 species are known,

and of this number only about 15 have been found in rocks above the Silurian system. The group entirely disappeared with the close of Paleozoic time.

Consult: Forbes, "On the Cystidea of the Silurian Rocks of the British Islands," *Memoirs of the Geological Survey of Great Britain*, vol. ii., part 2 (London, 1818); Billings, "On the Cystidea of the Lower Silurian Rocks of Canada," *Figures and Descriptions of Canadian Organic Remains, Decade III.* (Montreal, 1858); Hall, "Descriptions of Some New Fossils from the Niagara Group," *Twentieth Annual Report of the New York State Cabinet of Natural History* (Albany, 1867); Barrande, "Cystidées," *Système Silurien du Centre de la Bohême*, vol. vii. (Prague and Paris, 1887); Bather, "The Cystidea," in Lankester's *Treatise on Zoology*, part iii., chap. ix. (London, 1900); von Zittel and Eastman, *Textbook of Paleontology*, vol. i. (London and New York, 1900). See CRINOIDEA; ECHINODERMATA; and articles on the other classes of echinoderms.

CYSTOLITHS (Gk. *κυστίς*, *kystis*, bladder + *λίθος*, *lithos*, stone). Masses of cellulose and calcium carbonate (the chief constituent of limestones), found in the cells of plants belonging to the families Urticaceae and Acanthaceae. They are most common in the epidermis of both leaves and stems, but are found also in the cortex and pith. A single cystolith occupies a cell, nearly filling it, though the cell is enlarged. Cystoliths are irregularly warty or nodulated like a compact bunch of grapes. Each is attached to the wall of the cell in which it lies by a short stalk of cellulose. In reality the cystolith is an outgrowth from the cell-wall, at first peg-shaped, later club-shaped, and finally warty. Its foundation substance is cellulose (the same as that of the wall), which is impregnated with a large quantity of calcium carbonate in the form of very fine granules, thus forming a stony mass. The stalk often contains silica. The carbonate is to be regarded as a waste product from the chemical processes occurring in the plant, and is of no further direct use. It can readily be dissolved out by weak acids, the process of solution being accompanied by effervescence and the evolution of carbonic-acid gas (carbon dioxide). Good examples of cystoliths are to be found in the leaves of nettles (*Urtica*) and of the fig (*Ficus*).

CYTASE (from Gk. *κύτος*, *kytos*, cavity, cell). An enzyme that attacks the cell-walls of plants and alters the chemical composition of some of the components so that the walls swell up in water, become translucent, and finally dissolve. The process is one of digestion. It is not yet known whether what is called cytase is a single enzyme or several, no sufficient study having been possible. Cytase has been found in the hyphae of various fungi which live as parasites in plants, destroying their tissues. It has also been identified in the seeds of many grasses, in which it is secreted chiefly by the 'gluten layer' (a layer of cells outside the starch-bearing ones), and in the seeds of certain Leguminosae, palms, etc. In many seeds the reserve food is stored as cellulose in the form of thickened walls, making the food-bearing tissue, the endosperm (q.v.), of bony hardness—e.g. vegetable ivory, the seed of a palm (*Phytolophus Indica*). In this seed certainly, and probably in all such

seeds, cytase is produced at germination to digest the reserve cellulose and render it available as food for the growing embryo. Since the substances which take part in the formation of cell-walls are numerous and diverse, and their composition is still uncertain, no adequate knowledge has been obtained as to the products of their digestion by cytase. From the cellulose constituents one or more sugars are produced, possibly by hydrolysis, through dextrins. Cytase acts only on cellulose walls, being unable to attack lignified or cutinized walls. It acts most energetically in a weakly acid medium, but is destroyed by temperatures of 60 to 65° C. It may be obtained (mixed with diastase) from malt by the method described under **DIASTASE** (q.v.). See also **ENZYMES**; and **DIGESTION**.

CYTHE'RA. See **CERIGO**.

CYTH'ERE'A. See **VENUS**.

CYTHE'RIS. A well-known Roman courtesan, the mistress of Marcus Antonius and later of Gallus, the elegiac poet. She is referred to under the name of Lycoris in Vergil's tenth Eclogue.

CYTISUS (Lat., shrubby kind of clover). A genus of plants of the natural order Leguminosae, of which some of the species, having long twiggly branches, are popularly called broom, others are called laburnum, while others still are generally known by the name cytisus. The species are numerous—small trees or shrubs, with leaves of three leaflets, and yellow, white, or purple flowers, natives chiefly of the warmer temperate parts of the Old World. Many of them are very beautiful, and some are among the esteemed ornaments of our shrubberies, others of our greenhouses. Several species of *Cytisus* have been recommended as forage plants, stock readily browsing upon their green twigs. *Cytisus scoparius*, the Scotch broom, is a form so valued, while *Cytisus proliferus alba*, the tagasaste of the Canary Islands, is highly commended. Trials of it in California have not substantiated the rather extravagant claims made for it.

CYTOL'OGY (Gk. κύτος, *kytos*, cell + λογία, *logia*, account, from λέγειν, *legein*, to say). A branch of the sciences of botany and zoology. As histology is largely concerned with tissues, so cytology deals principally with cells, the elements which make up the tissues. Although it is only recently that botanists have begun to make a specialty of this subject, the work has been prosecuted with great vigor and the subject is beginning to assume some definiteness. The chief problems at present are the structure and activities of protoplasm, the life history of plastids, the structure and function of the nucleus, the reduction of chromosomes, the origin and development of the achromatic figure, the centrosome, the cell-wall, the development of the sex cells, fertilization and the formation of the embryo, and, most difficult of all, the problem of heredity.

BOTANICAL CYTOLOGY. As yet little is known regarding the structure of protoplasm in plants, but the investigations which have been made favor the assumption that its structure is identical with that in animals. Much more attention has been paid to the nucleus. Even the small nuclei of many of the algae and fungi have been

studied, and the details of their structure and mode of division quite accurately determined. No organ of the cell has been so assiduously investigated as the chromosome, but nevertheless most of its important problems remain to be solved. The fact that the number of chromosomes is constant for a given species, and the phenomena of fertilization indicate that the chromosome is a permanent organ of the cell, but its life history from one cell generation to another has not yet been traced, the identity of the several chromosomes being lost in the resting nucleus. In the flowering plants the splitting of the chromosomes during nuclear division is generally conceded to be longitudinal in all cells except spore-producing cells in which the reduction of the chromosomes is taking place, and even here most botanists believe that the splitting is longitudinal, although a transverse splitting, i.e. a reducing division in the sense of the Weismann school, has been reported by investigators of undoubted ability. Both observations and theories are still very conflicting. The origin and development of the achromatic figure have received large attention, especially during the past five or six years. It was formerly supposed that the achromatic figure always rose under the influence of the centrosomes, but recent observations have made it very doubtful whether a centrosome exists at all in the angiosperms, and it is almost equally doubtful whether such an organ exists in the gymnosperms and pteridophytes, unless the 'blepharoplast,' a centrosome-like body which develops the cilia of the male cell, be interpreted as a genuine centrosome. In the other groups, except the mosses, which have received scant attention, an undoubted centrosome has been demonstrated.

The development of the sex cells, from the earliest appearance of the archesporium up to the time of fertilization, has been repeatedly studied in various plants, but the work has been morphological rather than cytological, little attention having been paid to the details of cell contents except in case of mother cells. In the study of cells more immediately concerned in fertilization, the cells of the sporogenous tissue have been slighted. Some of the most important cytological work deals with the problems of fertilization. The question of sexuality in the Ascomycetes has received a definite answer in the case of several forms by the demonstration of an actual process of fertilization. The fusion of the sex nuclei in ferns has been described with more or less completeness. In the gymnosperms, where the sex cells are extremely large, the process of fertilization has been more satisfactorily investigated, and it has been found that both the nucleus and the cytoplasm of the male cell enter the egg, but that the nucleus slips out from its cytoplasmic mantle before it reaches the nucleus of the egg. The male nucleus with its nuclear membrane still intact is then received bodily into the much larger egg nucleus. The chromatin of the two nuclei in the form of two distinct spires has been observed, and it has been suggested that the chromatins of the two nuclei may remain distinct during the later stages of fertilization, and even during the cell divisions which follow. In the angiosperms, while the union of the sex nuclei has been repeatedly observed, the behavior of the chromatin is practically unknown. Two male cells are dis-

charged from the pollen-tube into the embryo-sac; the nucleus of one of these cells unites with the nucleus of the egg and the first cell of the sporophyte is formed. It has recently been found that the second male cell often unites with the definite nucleus of the embryo-sac formed by the fusion of the two polar nuclei, so that there is a 'double fertilization.' Double fertilization has been observed in monocotyledons and dicotyledons, but whether it is the usual method of fertilization is not entirely settled. While it is becoming conceded that the problems of heredity must be ultimately problems of the cell, nearly all the work of botanists along this line must be classed as morphological. See CELL (in plants); EMBRYOLOGY; SEX.

CY'TOPLASM. See CELL (in plants).

CYZICUS (Lat., from Gk. *Κύζικος*, *Kyzikos*). A colony of Miletus in the Propontis, founded probably about B.C. 676, on the south shore of the island of Arctomessus, which has now become a peninsula, though in ancient times it was connected with the mainland by bridges. Its situation and two good harbors made it early a prosperous town, while its strong position enabled it to maintain its freedom. It was favored by the Romans, and after sustaining a long siege by Mithridates it was made a free city, a privilege which it lost under Tiberius. The site is still covered with extensive ruins. It lies to the southeast of the island of Marmora, and about 70 miles southwest of Constantinople.

CZACKI, chäts'kê. **TADEUSZ**, Count (1765-1813). A Polish writer. He was born at Poryck, Volhynia. At twenty he obtained an office in the Superior Court of Justice at Warsaw, and in 1788 was appointed to the Treasury Commission of the Diet. His interest in the economic welfare of his country impelled him to travel through Poland and to produce a map of its river system. The development of navigation on the Dniester engaged his particular attention. When his property was confiscated at the second partition of Poland he became a professor at Cracow; but Paul I., to whose coronation he went as deputy from Volhynia, restored what he had lost. After this Czacki's whole life was devoted to the education of his countrymen. His plans for disseminating instruction in the Polish provinces of Russia, the people of which were extremely ignorant, met with the approval of Alexander I., and in 1803 he was made inspector of the schools in the governments of Volhynia, Podolia, and Kiev. He gave, out of his various resources, about 500,000 thalers to various schools. The Gymnasium of Kremenetz, which he founded, was the main object of his care. For a generation this institution was the spiritual centre of Poland, furnishing the champions of national self-consciousness against the deadening influence of French pseudo-classicism. Accused of stirring up political discontent among his countrymen, Czacki went to Saint Petersburg in 1807, and so ably defended himself that Alexander I. appointed him deputy of Prince Czartoryski, who was curator of public instruction in the Polish section of Russia. Czacki died at Dubno, and his collections passed into the hands of Czartoryski. His works were published in three volumes (Posen, 1843). They are in the main historical and archaeological. His most valuable work is a treatise

On Lithuanian and Polish Laws (2 vols., Warsaw, 1800).

CZAJKOWSKI, chî-kôv'ske, **MICHAŁ** (1808-86). A Polish novelist. He was born near Berdichev in the Ukraine, where, in 1831, he participated in the insurrection against Russia, and was compelled to flee to Paris. In 1840 a number of Polish émigrés sent him on a secret mission to Turkey, and in 1851 he embraced Mohammedanism. As Mohammed Sadik he commanded a body of troops called the Cossacks of the Sultan. He fought with distinction against the Russians in 1853-54. Amnestied by Russia in 1873, he removed to Kiev. In consequence of an accusation of treason subsequently made against him, he committed suicide. Czajkowski obtained wide celebrity through his stories of Cossack life, several of which have become extremely popular and have been translated into German, French, and English.

CZAR, zär (Russ. *tsarî*, Bohem. *tsar*, Ochurch Slav. *tsčsarî*, *tsšsarî*, through OHG. *keisar*, from Lat. *Cæsar*). The alternative title of the Russian Emperor; also written **TSAR**. During the Middle Ages the Emperor of the East and the Mongol Khans appear under the title of Czars in Russian contemporary literature, while the rulers of the various Russian provinces are called grand dukes till the sixteenth century. In 1547, however, Ivan the Terrible caused himself to be solemnly crowned Czar of Moscow. From this time the Russian monarchs called themselves by this title until the conquest of Little Russia and Smolensk caused them to assume that of Czar of All the Russias. The word now became practically the equivalent of Emperor; yet Peter I., in 1724, thought fit to assume this latter title in addition, and as the Russian language had no term corresponding to it, the Latin word *Imperator* was introduced, while the Empress was termed *Imperatritsa*. At first several European powers refused to sanction the assumption of imperial dignity by the Russian Czar, but ultimately consented to do so. The wife of the Czar was named *Czaritsa* (Czarina); the sons, *Czarevitch*; the daughters, *Czarevna*; but after the death of Alexis, Peter I.'s son, these titles were abolished, and the imperial princes were called grand dukes and the imperial princesses grand duchesses. In 1799 the Emperor Paul I. introduced the title of *Czarevitch* (not *Czarevitch*) for his second son, the Grand Duke Constantine. The heir apparent and his wife are still called *Czarevitch* and *Czarevna*. Among the Russian people themselves, the Emperor is more frequently called *Gosudar*, i.e. lord, than Czar. See **RUSSIA**.

CZARNIECKI, or **CZARNECKI**, chärnyč'skê, **STEFAN** (1599-1665). A Polish general. He was distinguished by his bravery and brilliant generalship in the war against Charles X. of Sweden (1655-60), upon the conclusion of which he was hailed as the liberator of his country, which, simultaneously with the great onslaught of the Scandinavians, had been assailed by the Russians and Transylvanians. He also won laurels in the war against the Cossacks (1660-61), successively defeating them in two great battles. He had attained the highest rank in the Polish army when, attended by only a few horsemen, he undertook an expedition to the Crimea, in order to secure an alliance with the Tatars. In conse-

quence of the fatigue and exposure of this journey he died at a village in Volhynia. He has been styled the Polish Du Guesclin.

CZARTORYSKI, châr'tô-ris'kê, ADAM JERZY (George), Prince (1770-1861). A Polish patriot, born at Warsaw, January 14, 1770. He was the son of Prince Adam Casimir Czartoryski, the head of an ancient Polish house. After studying in Edinburgh and London, he returned to his native country and took part against Russia in the war following the second partition of Poland, in 1793. On the defeat of the Poles, Czartoryski was taken to Saint Petersburg as a hostage, and here he exhibited so much ability and prudence as to gain the friendship of the Grand Duke Alexander, and the confidence of Emperor Paul, who made him ambassador to Sardinia. When Alexander ascended the throne (1801) he appointed Czartoryski assistant to the Minister of Foreign Affairs; and he took an active part in official life until after the peace of Tilsit (1807). As curator of the University of Vilna he exerted all his influence to keep alive a spirit of nationality among the Poles, and when some of the students were arrested on a charge of sedition and sent to Siberia, Czartoryski resigned his office. His successor reported to the Emperor that the amalgamation of Russia and Lithuania had been delayed a century by Czartoryski's activity as head of the university. When the Revolution of 1830 broke out, he threw in his lot with his countrymen. He was elected president of the provisional Government, and in this capacity summoned a national diet, which met in January, 1831, and declared the Polish throne vacant, and elected Czartoryski head of the National Government. He immediately devoted half of his large estates to the public service, and adopted energetic measures to meet the Russian invasion. The Poles were soon crushed by superior numbers, and Czartoryski—specially excluded from the general amnesty, and his estates in Poland confiscated—escaped to Paris, where he afterwards resided, the friend of his poor expatriated countrymen, and the centre of their hopes of a revived nationality. In 1848 he liberated all the serfs on his Galician estates, and during the Crimean War he ineffectually endeavored to induce the Allies to identify the cause of Poland with that of Turkey. He refused an amnesty offered to him by Alexander II., and died in Paris, July 16, 1861. Consult his *Mémoires et correspondance avec l'empereur Alexandre Ier* (Paris, 1887; English translation, Sielgerd (London, 1888); Morfill, *Story of Poland*, in "Stories of the Nations" series (London, 1893). See POLAND.

CZASLAU, ehäs'lou, Bohem. pron. ehäs'läv. A town of Bohemia, about 40 miles east-southeast of Prague (Map: Austria, D 2). The Church of Saint Peter and Saint Paul was the place of burial of the blind Hussite leader Ziska, a fine statue of whom adorns one of the public squares. The town's manufactures include beet-sugar, alcohol, and beer. Between Czaslau and the neighboring village of Chotusitz the Prussians under Frederick the Great gained a decisive victory over the Austrians under Charles of Lorraine, May 17, 1742. Population, in 1890, 8145; in 1900, 9105, mostly Czechs.

CZECH (chêk) or **BOHEMIAN LANGUAGE**. The Czech language, like the Polish,

Kashubian, and Sorbian, belongs to the north-western group of the Slavic languages (q.v.). The number of persons speaking Czech, exclusive of the Slovaks, is about 6,000,000. Of these 3,650,000 are found in Bohemia, 1,550,000 in Moravia, 130,000 in Austrian Silesia, 300,000 in other Austro-Hungarian provinces, 30,000 in Russia, 100,000 in Germany, and 250,000 in America. The Czechs occupy the quadrangle bounded by the Bohemian Forest, the Erzgebirge, the Sudetic Mountains, and the Little Carpathians. They are thus surrounded on three sides by Germans, and only on the eastern side do the Czechs come in contact with Slavs: in Silesia with the Poles, and in southeastern Moravia and Hungary with the Slovaks, their nearest kindred, with whom the Czechs are usually grouped into the Czecho-Slovakian division. Within the quadrangle the Czechs are interspersed with Germans, against whom they have maintained a continuous struggle. (See CZECH LITERATURE.) Literary Czech is most nearly related to the dialect of the Prague district, but taken as a whole the Czech language presents a great variety of well-defined dialects.

The first mention of the existence of Czech dialects is found in Jan Blahoslav's *Grammar* (1571), published by Jirček in 1857. The Slavic alphabets used in the earliest times were superseded by the Roman characters on the establishment of Roman Catholicism instead of the earlier Greek Orthodox faith. The Latin alphabet was insufficient to reproduce all the native sounds, and diacritical letters were introduced. Thus, *č* = Engl. *ch*, *ž* = Engl. *zh* (as in pleasure), *š* = *sh*, while the acute accent is used to denote long vowels. Among the phonetic characteristics of the language may be noted: (1) Disappearance of the old Slavic sounds *ū*, *ī*, and their transition into *e*: Old Church Slavic *sūnū*, sleep, *dnī*, day, *livū*, lion, *liva* (id., gen. sing.) = Czech *sen*, den, lev, lva. (2) Substitution of open sounds *u*, *ú* and *a*, *ě*, *e* for the old Slavic nasal vowels *a* and *e*: *muka*, torture, *nesu*, I carry = Old Church Slavic *maka*, *nesa*; *patro*, five, *deset*, older *desēt*, ten = Old Church Slavic *petro*, *desētī*. (3) The so-called transvocalization, whereby *a* becomes *ě* (*e*), *á*, *ie* (*é*, *í*): *zeme*, land, for *zemīa*, *dušĕ*, soul, for **dušĭa*, while *u*, *ú* = *ju*, *jú*, become *i*, *í*: *duši* for **dušu* (acc. sing., cp. Russian *dushu*), *duši* for *dušŭ* (abl. sing., cp. Russian *dushoyu*), *lid* for **lud*, people (Russian *lyud*). (4) The obliteration of distinction between *y* (= Engl. *ī*) and *i* (Engl. *ē*) in pronunciation: *býk*, bull, *mýš*, mouse, *sýr*, cheese, are pronounced as if spelled *bik*, *mish*, *sir*: *byl*, I was, and *bil*, I beat, are pronounced precisely alike. (5) Syllabic or vocalic *r*, *l*, *m*, *n*: *zrno*, grain, *srdec*, heart, *vlna*, wave, wool, *slny*, strong, correspond to Russian *zerno*, *serdtsē*, *volna*, *silniy*; *Rožmberk Liemburk*, represent German Rosenberg, Luxemburg. This peculiarity is common also to the Slovakian and Serbo-Horvatan (Serbo-Croat). (6) Long and short vowels: Short, *a*, *e*, *i*, *o*, *u*, *y*; long, *á*, *é*, *í*, *ó*, *ú*, *ý*. (7) The primary accent is expiratory or stressed, and is always on the first syllable of the word, as in Slovakian, Serbo-Lusatian, and South Kashubian. This accent has been proved to be an historical development of the primitive Slavic free accent. See SLAVIC LANGUAGES.

The quantitative system of versification based on the Latin has been almost entirely superseded of late by the tonic system—more proper

to the spirit of the Slavic languages. Among the inflectional peculiarities of the language the following are most noteworthy: In declension of nouns—loss of dual; confusion of various stems; confusion of case-endings; change of quality and quantity of the root-vowels. In conjugation it comes very close to the primitive Slavic, retaining both the infinitive and the supine. All past tenses are periphrastic, and the forms of the future are either periphrastic—in verbs of incomplete or imperfective action—or are represented by the present in verbs of completed or perfective action.

From the point of view of euphony, the Czech language stands lower than the Russian or Polish, although superior to the latter in some particulars, as in the comparative rarity of sibilants and the absence of nasal vowels.

SLOVAKIAN. Along with the Czech language must be mentioned the Slovakian language, spoken by 2,500,000 persons in northwest Hungary and in America. Its literature is only a century old, and its independent development was entirely due to the great wave of national reawakening that swept over Europe at the end of the eighteenth and the beginning of the nineteenth century. The movement, communicated to the Czech language, spread to the kindred Slovakian. In spite of the serious opposition on the part of such prominent Bohemians as Havlíček, Šafařík (q.v.), and Kollar (q.v.), himself a Slovak, a Slovakian literature was established. The pioneer of the movement was Antonín Bernolák (1762-1813), whose *Dissertatio Philologica-Critica de Literis Sclavorum, Grammatica Slavica* (Prosburg, 1790), and *Lexicon Sclavicum Bohemico-Latino-Germanico-Hungaricum* (6 vols., Buda, 1825-27) supplied the foundation for Slovak literature. The other great names are: the poet Jan Holý (1785-1849), Ljudevit Štur (1815-56), Josef Hurban, and Michael Hodž, who brought the language to its high standard of literary perfection. Among the more recent writers the following deserve especial mention: the famous Martin Hattala, one of the foremost of Slavic linguists; Svezozár Hurban Vajanský, son of Josef Hurban; the lyric poet Orsag Hvézdoslav, and the novelist Kukučín, a powerful portrayer of popular life and manners. The language in the works of these writers, though closely kindred to the Czech, exhibits many well-defined peculiarities which justify its classification as a separate branch. There are numerous works that are not found in the Czech language, and many features bring it nearer to the Russian, Polish, and Servian than to the Czech. Ethnographically considered, the Slovaks are yielding before the march of the stronger and politically dominant Hungarian nationality; but Slovak literature has received too strong a start to allow of any doubt as to its future development.

BIBLIOGRAPHY. Grammars of the Czech language: Dobrovský, *Lehrgebäude der böhmischen Sprache* (Prague, 1819); Hattala, *Srovnávací mluvnice jazyka českého a slovenského* (ib., 1857); Gubauer, *Hláskosloví jazyka českého* (ib., 1876); id., *Mluvnice česká pro školy střední* (ib., 1890), excellent; id., *Historická mluvnice jazyka českého* (ib., 1894, 1896-98)—in all four volumes are promised by the author of this epoch-making work; Vymazal, *Böhmische Grammatik für deutsche Mittelschulen und Lehrer-*

bildungs-Anstalten (Brünn, 1881)—although somewhat behind latest philological researches, a most practical and simple handbook; Masařík, *Löhmische Schulgrammatik* (5th ed., Prague, 1890).

Dictionaries of the Czech language: Jungmann, *Slovník česko-německý* (5 vols., Prague, 1835-39); Čelakovský, *Additions to Jungmann's Dictionary* (Prague, 1851); Kott, *Böhmisch-deutsches Wörterbuch*, especially Grammatico-Phraseological (7 vols., Prague, 1878-93); Sumavský, *Böhmisch-deutsches Wörterbuch* (3d ed., Prague, 1874); Rank, *Taschenwörterbuch der böhmisch-deutschen Sprache* (6th ed., Prague, 1895).

CZECH or BOHEMIAN LITERATURE.

Among the Slavic literatures the Czech is inferior to the Russian or the Polish (q.v.), although chronologically it precedes them both.

First Period (to 1410).—The earliest literature of the Czech language came into existence with the introduction of Christianity in Bohemia, in 865, by Cyril and Methodius, the apostles of the Slavs. The earliest extant monument is the Kyrie Elcison *Hospodine pomiluj ny* (Lord, have mercy upon us). Greek Christianity and the Cyrillic alphabet (see KIRILLITSA), however, gave way to Latin Catholicism and Roman script. The famous Grüneberg manuscript (eighth or ninth century), the *Judgment of Libusha*, and the Königinhof manuscript (thirteenth or fourteenth century), discovered by Hanka in 1817, are the only remains in the native tongue which belong to this period, and their authenticity is somewhat doubtful. The influence of the Teutonic knights was growing rapidly among the natives, and the result was that until about the fourteenth century vernacular literature was entirely superseded by Latin. At the end of the thirteenth century a Czech translation of the Latin *Alexandreis* of Gualterus de Insulis (Philip Gaultier de Châtillon) was made, and to the early years of the following century belong Czech versions of two episodes from the Arthurian legend—*Tristan*, according to Eilhart of Oberge and Gottfried of Strassburg, and *Tauridias and Floribella*, after Pleier. Original works in Czech are the famous *Rhymed Chronicle of Bohemia*, by Dalimil, of 1314, and the romantic story *Tkadleček* (The Weaver), written in strikingly beautiful prose about the end of the fourteenth century. Other works that contributed to the development of the literature were translations of the travels of Marco Polo and Sir John Mandeville. The original writers of the period are: Thomas Štítný (1325-1410), one of the first alumni of the University of Prague, which was founded in 1348; Andrew of Duba, and the poet Flaška. Štítný exercised a great influence over religion and literature in Bohemia, and, properly speaking, paved the way for the later Hussite movement. Andrew of Duba is the reputed author of *The Book of the Old Lord Rosenberg* and *The Exposition of the Law of the Bohemian Land*. Smil Flaška, Lord of Pardubitz, composed didactic and satirical poems—*Father's Advice to His Son*; *Contest Between Water and Wine*; *Dispute Between Body and Soul*; *New Council*; and *The Groom and the Scholar*. They abound in local allusions, and are a rich mine of information for the culture history of the country.

Second Period (1410-1620).—The Golden Age of Czech literature.

The reformer Jan Huss, who, by the religious movement which he inaugurated, contributed so powerfully toward the assertion of nationality by the Czechs, gave an immense impulse to the development of Czech literature, and 1410—the year of his open breach with Rome—is commonly considered the beginning of a new era. Though a master of the Latin tongue, Huss preferred Czech for works which were designed for the people as a whole, and the language received at his hands a perfection which it had never before attained. Since his time the Czech has undergone comparatively little change from a linguistic point of view. Huss adopted as the basis the speech in actual use around Prague. He contributed, moreover, to the development of the language by grammatical works like his *Czech Orthography* (published in 1857 by Šembera). After the death of Huss the Moravian Brethren assiduously cultivated the spirit of nationalism, and directed their energies to developing their native idiom. Among these champions of the people, the following names are the most noteworthy: Petr Chelčický (1390-1460), a pupil of Huss, was the theoretical expounder of his master's doctrines. In his works, such as *The Net of Faith* and *Book of Expositions of Sunday Lessons*, various religious and political questions are treated in a surprisingly liberal manner. Other writers of distinction of this period are Victorin Cornelius Všehrad (1460-1520), the author of *Nine Books of Laws . . . in Bohemia*, and Ctibor Cimburg (1437-94), who wrote the famous *Toračov Book*—only two out of a long line of famous jurists, who devoted their time and labors to the scientific exposition and systematization of Bohemian law. Their works are written in masterly style, and contributed much to the progress of the Czech juridical language. These two, with several others, constituted the Hussite minority among the humanists who made their appearance in Bohemia with the Renaissance. The other, more numerous faction of the humanists, was, strange as it may seem, solidly opposed to the doctrines of Huss. Among these were Bohuslav of Lobkovic (1462-1510) and Rehoř Hrubý of Jelení (1450-1514). Lobkovic collected the most remarkable library of his time, wherein he was greatly helped by the introduction of printing in Bohemia in 1468, when the *Trojan Chronicle*, the first book to be printed in the Czech language, appeared at Pilsen. Lobkovic and his contemporaries laid all subsequent Bohemian literature under deep obligations. They translated Greek and Latin classics, as Cicero, Seneca, Isocrates; wrote Latin poems; compiled lexicographical works, like the *Lexicon Symphonum*, of the Czech, Greek, Latin, and German languages, by Siegmund Hrubý (1497-1554), son of Rehoř Hrubý. Grammatical studies of the Czech language were embodied in Jan Blahoslav's (1523-71) *Czech Grammar* (1571). It contains disquisitions on the subject of how to translate idiomatically various words, phrases, constructions, etc. Literary and scientific activity was at its height, and men of science, like Tycho de Brahe and Kepler, made Bohemia their home. The Bohemian historians of this period combined with their patriotic zeal a scientific preparation and seriousness of purpose which made their work especially valuable and reliable. They found their prototype

in the anonymous *Old Bohemian Annals*, embracing the period of 1378-1527. Adam Veleslavin (1545-99), whose *Historical Calendar* is his best-known work, represents the highest type among these historians. Vaclav Hájek (?—1553) is the author of a *Chronicle* more interesting than accurate. Jan Blahoslav, who has been mentioned above, wrote an excellent history of the Moravian Brethren, of whom he was a bishop. He is also famous for his supervision of the Czech translation of the Bible from the original tongues, which is for the Czech what the King James Version of the Bible is for the English. Blahoslav did not live to see his work printed; it was published in six volumes in 1579-93, at the expense of Jan of Žerotin, a Moravian patron of letters, and is known as the *Kralitz Bible*. The unusual vigor displayed in the domain of prose and the widening of the intellectual horizon were naturally communicated to the field of poetry. Prince Hynek Poděbrad (1452-92) wrote his *May Dream* and other poems which won favor. Nicholas Dačický (1555-1626) composed a satirical poem, *Prostopravda*, and many works of an historical character. Among the religious poets Jan (1500-72), a Moravian bishop, deserves special mention. The greatest poet of the latter part of this period, which is known as the 'Golden Age,' was Simon Lomnický (1552- after 1622). His works include didactic and satirical poems and sacred dramas. Chief among them are the satire *Cupid's Arrow*, for which the King, Rudolph II., ennobled him and granted him an annuity; and the didactic *Short Precept for a Young Householder*, which is full of valuable allusions to the manners and customs of the time.

Third Period (1620-1774).—In the battle at the White Mountain in 1620, the Bohemians lost their political independence, and Ferdinand I. of Austria, seven years later, made Catholicism the State religion of Bohemia. The works of the Protestant writers that had made the 'Golden Age' so brilliant were now seized everywhere and destroyed. Nevertheless, it was during the opening years of this period that Czech literature reached its highest stage of purity and finish in the works of Karl Žerotin and Jan Komenský. Karl Žerotin (1564-1636), great as are his polemical and historical writings, acquired a lasting fame through his enormous correspondence, in which he stands in the very first rank with the few famous letter-writers of the world. Jan Amos Komenský (see COMENIUS) (1592-1670), who became one of the greatest authorities on questions of pedagogy, spent his life in exile, like Karl Žerotin. His *Magna Didactica*; *Janua Linguarum Reserata Aurca*; and *Informatorium*, form his permanent contributions to the domain of pedagogy, philosophy, and religious controversy, and they advanced materially the stylistic standard of Czech literature. His purely literary work, *Labyrinth of the World and Paradise of the Heart*, is more important as a product of pure literature. All the other writers of this period are of little importance. The systematic efforts of the Hapsburgs to crush the Czechs were successful. Higher society became Germanized, the Czech language was heard only in out-of-the-way hamlets, and Czech books became a great rarity. The works of the Jesuit writers of the period, who employed the Czech language for religious propaganda among the

masses—Sturm, Berlička, Steyer, and Koniaš—are full of barbarisms, monstrous forms and words. In 1774 Maria Theresa enforced by a decree the use of German in the intermediate schools as the language of instruction.

Fourth Period—Renaissance (1774 to the present day).—The forcible suppression of the native tongue in the common schools of Bohemia produced results entirely opposite to those which were expected, and met a vigorous protest. Count Kinsky published in German a plea for the Czech language under the title *Erinnerung über einen hochwichtigen Gegenstand* (1774), which was followed in 1775 by Balbin's *Dissertatio Apologetica Linguae Sloenicae*, published by Pelzel. Pelzel himself (1734-1801) was one of a number of young scholars who devoted themselves to the study of their native tongue and the history of their country. Thus appeared Fr. Thoms's *Böhmische Sprachlehre* (1782) and K. I. Thám's *Kurzgefasste böhmische Sprachlehre* (1785), which laid the foundations for the study of the language. Pelzel's own contributions were: *Typus Declinationum Linguae Bohemicae Novo Methodo Dispositarum* (1793); *Grundsätze der böhmischen Grammatik* (1795); and especially his historical works, of which the *New Bohemian Chronicle* was chief. These latter works awakened interest in their own history among the Czechs. A chair of Czech language was established at Prague in 1793 (Pelzel). The greatest name of this period of Czech literature is that of Josef Dobrovský (1753-1829) (q.v.), the 'patriarch of Slavic philology.' In his works on grammar and literary history he gathered enormous lexical materials, and the historical and comparative method brought him to the discovery of the richness of the ancient classical language, to which his main interests were devoted. It is true that he made a *Collection of Czech Proverbs* in 1804, but all his works were written in German. Such men as Prochazka, Rulík, Puchmayer, Jan Nejedlý, V. Nejedlý, Huňkowsky, and others wrote pamphlets for the instruction of the people, compiled dictionaries and grammars, translated the classics of European literature, published periodicals, composed plays for the theatre, and even poetry in the sentimental style of the idyls of Gessner. These attempts met with very serious obstacles, owing to the imperfect state of the language, which was practically the old language of the classical period, and which naturally lacked terms for new ideas and concepts that had come into vogue during the third period. The language was brought to its final state of perfection in the works of Jungmann (q.v.) (1773-1847), the most illustrious name of the early renaissance. His translation of *Paradise Lost* (1811), an almost incredible *tour de force*, widened the horizon of poetical speech; his *Czech Dictionary* contained the vocabulary of the language; while his *History of Czech Literature* presented a complete survey of all the literary remains. He was particularly happy in coining new words, and whenever this expedient was found insufficient he borrowed from other Slavic languages, especially Russian and Polish. The four other names that are most closely linked with that of Jungmann as leaders of the renaissance of Bohemia are Kollar, Šafařík, Palacký, and Hanka. Kollar (q.v.) (1793-1852), poet and scholar, is famous for his *Daughter of Slava* (1824), one of the poetic masterpieces of the

Czech language, and his numerous prose works, among which that *On the Literary Reciprocity Between the Families and Dialects of the Slavic Nation* (1831) advocated literary Pan Slavism (q.v.). Šafařík (1795-1861) was one of the greatest philologists the Slavic countries have produced. Among his works, his *Slavic Antiquities* (1837) and editions of many literary monuments have all been of importance. Palacký (1798-1876) is an historian, whose *History of Bohemia* (5 vols., 1836-67) is an ideal combination of critical judgment, profound erudition, and striking style. Along with them may be mentioned Hanka (1791-1861), who discovered the manuscripts of Grüneberg and Königshof, and published a number of other important remains of Czech antiquities. The greatest poet of the period is František Ladislav Čelakovský (1799-1852), whose *Echoes* of Russian and Czech songs, and the long poem *The Rose of a Hundred Leaves*, together with the poetic works of Kollar, were most responsible for the reawakening of the poetic spirit of the nation. Other names of importance are those of the lyric poets Jablonský and Vinařícký, the epic writers Woel, Marek, Holý, and Erben, and dramatists like Kliepera and Tyl. Poetry seems to have absorbed all the best energies of the nation at that time, and the novel, which holds the chief place of honor in the literature of all other nations, did not reach any high level of development. Most works of fiction dealt with themes from Bohemian history. The most noted novelists are Chochołušek, Tyl, and especially Božena Němcová (1820-62), whose themes are simple country life. The masterpiece of the latter, *Babička* (Grandmother), has been translated into English.

The reorganization of the Austrian Empire on a constitutional basis in 1860-61, which allowed the people of Bohemia scope in the development of political life, and the furtherance of national aspirations, marks the beginning of the modern period in Czech literature. The foundation of a new national theatre at Prague and the establishment of a Czech university by the side of the old university (1882) gave a great stimulus to literary activity. Little by little the narrow 'national' current gave way to cosmopolitanism, with Mácha as the leading representative of Byronism. The recognized head of the young generation is Vítěslav Hálek (1835-74). The greatest living poet is Vrehlieký (born 1853), whose *A Year in the South; Pilgrimages to Eldorado*; and the historical dramas *Brothers and Drahomira*, as well as translations from European classics, are specially noteworthy. Equal in popularity is the poet and novelist Svatopluk Čech, whose best-known work is *Arabesky*. Zeyer, Heyduk, Arbes, Vlček, and the ladies Eliška Krásnohorská (born 1847) and Karolína Světlá (born 1830) are the most popular novelists of the present day. Great activity has also been exhibited in the departments of science, philology, and literary history, the most important names being those of Jireček, Šembera, Gebauer, and Patera.

BIBLIOGRAPHY. In Bohemian: J. Jungmann, *Historie literatury české* (Prague, 1825); K. Sabina, *Dějepis literatury československé* (Prague, 1863-66); J. Jireček, *Rukověť k dějinám literatury české* (Prague, 1874); A. Šembera, *Dějiny čeři a literatury české* (4th ed.,

Vienna, 1874); K. Tieftrunk, *Historic literary české* (3d ed. Prague, 1885); Fr. Bayer, *Stručné dějiny literatury české* (Olmütz, 1879); Bačkovský, *Zevrubné dějiny českého písmenictví doby nové* (Prague, 1888). German: Pypin and Spasovich, *Geschichte der slavischen Litteraturen*, bd. 2, abt. 2 (Leipzig, 1884). English: Francis, Count Lütow, *A History of Bohemian Literature* (New York and London, 1899).

CZEGLÉD, tsé'glád. A market-town of Hungary, about 46 miles southeast of Budapest (Map: Hungary, F 3). The inhabitants are chiefly employed in agricultural pursuits, the surrounding country being particularly adapted to the raising of grain and fruit. Considerable red wine is produced. Population, in 1890, 27,549; in 1900, 29,905.

CZEKANOWSKI, ché'ká-nóv'ské, ALEXANDER (1832-76). A Russian explorer. He was born in Volhynia, and studied at Kiev and Dorpat. Banished to Siberia in 1863 because of his participation in the Polish insurrection of that year, he was five years later permitted to settle at Irkutsk. Here, as the agent of the Imperial Geographical Society, he began a series of geological investigations extending along the Lower Tunguska, the Olenek, and the Lena, the results of which were published chiefly in Petermann's *Mitteilungen* (1874 et seq.). Amnestied by the Government, he returned to Saint Petersburg, where, during an attack of melancholy, he committed suicide.

CZELAKOWSKY, ché'lá-kóv'ské. See CELAKOVSKY.

CZENSTOCHOWA, chén'stó-kó'vá. A town of Russian Poland in the Government of Piotrkow, situated near the left bank of the Warthe, on the Warsaw-Vienna Railway. It consists of the old and the new town, and is of considerable industrial importance. There are a number of large cotton-mills, iron-foundries, paper-mills, breweries, flour-mills, etc. Population, in 1897, 45,130. Czenstochowa owes its fame to the adjacent monastery of the Order of Saint Paul the Hermit, situated on the Warthe and visited annually by over 200,000 pilgrims. The chief attraction is the picture of the Virgin, made of dark wood and known among the Catholics of Poland and Russia as the Black Virgin. It is supposed to be of Byzantine origin and to have been brought to the monastery at the end of the fourteenth century. The monastery was formerly fortified, and in 1655 withstood a siege of thirty-eight days by the Swedish troops.

CZERMAK, chér'mák, JAROSLAW (1831-78). A Bohemian painter, brother of Johann Nepomuk Czermak, the physiologist. He was born in Prague, and studied in that city under Christian Ruben, in Antwerp under Gallait, in Brussels, and finally in Paris under Robert Fleury. His early paintings treated chiefly subjects from the history of Bohemia, but later he devoted himself more and more to genre scenes. After a journey in 1858 through Hungary, Croatia, Bosnia, Dalmatia, and Montenegro, when he made abundant studies in national types and costumes, the life of the southern Slavs became his favorite field. Among his most noteworthy pictures are: "Murder of Wallenstein's Companions at Eger," "Slavonian Emigrants," "Norman Fishermen in a Boat Reading the Bible" (1850): "The

Court Poet of Rudolf II. Begging on the Bridge of Prague" (1854); "Hungarian Swineherd" (1854); "Montenegrin Woman and Child" (1861); "Rape of a Herzegovinian Woman by Bashi-Bazouks" (1867); "Return of Montenegrins to Their Devastated Village" (1877).

CZERMAK, JOHANN NEPOMUK (1828-73). A German physician, born in Prague. He studied at the universities of Vienna, Breslau, and Würzburg, and was appointed a lecturer on physiology and microscopic anatomy at the University of Prague. Subsequently he held a professorship of zoölogy and comparative anatomy at Graz (1855-56), and of physiology at Cracow (1856-58), Pest (1858-60), Jena (1865-69), and Leipzig (1869-73). At Leipzig he erected at his own expense a laboratory and an auditorium specially arranged for demonstrations in experimental physiology. He is best known for having made notable improvements in the laryngoscope and for having been the first systematically to employ that instrument. His publications include *Der Kehlkopfspiegel und seine Verwertung für Physiologie und Medizin* (1860; 2d ed. 1863). Consult the biography by Springer in the *Gesammelte Schriften* (2 vols., Leipzig, 1879).

CZERNOWITZ, chér'nó-vits (Ruman, *Cernăuți*). The capital of the Austrian Crownland of Bukowina, situated on a hill near the right bank of the Pruth, about 164 miles east-southeast of Lemberg, not far from the Rumanian and Russian frontiers (Map: Austria, J 2). Most of the public buildings are quite modern. Among the more noteworthy ones may be mentioned the Archiepiscopal Palace, a handsome Byzantine structure, the Greek Oriental Cathedral, copied from the Church of Saint Isaac in Saint Petersburg, the Armenian Church, and the sumptuous Jewish synagogue in Moorish style. Czernowitz is the seat of a Greek Oriental archbishop. Its educational institutions include a university founded in 1875, with a library of 60,000 volumes, a gymnasium, industrial and trade schools. It has manufactures of machinery and oil. There are also saw-mills and breweries. Population, in 1890, 54,171, of whom 27,000 were Germans, 10,000 Ruthenians, 8000 Rumanians, 8000 Poles, the above figures including more than 17,000 Jews counted with the Germans and Poles according to the language used by them; in 1900, 69,619. Up to 1774, when it was occupied by the Austrians, who made it the capital of Bukowina, Czernowitz was an unimportant village.

CZERNY, KARL (1791-1857). An Austrian pianist and composer, born in Vienna. He was at first instructed by his father, Wenzel Czerny (1752-1832), then studied under Beethoven, with whom he was a great favorite, and under Clementi. At the early age of fifteen he was in great demand as a teacher and also rapidly won high reputation as a virtuoso. Among his pupils were Liszt, Thalberg, Jaell, and Kullak. He left over 1000 compositions, of which his instructive works for the pianoforte are of permanent value. They are "Die Schule der Geläufigkeit," op. 299; "Tägliche Studien," op. 337; "Die Schule des Virtuosen," op. 365; "Die Schule der Fingerfertigkeit," op. 740; and others.

CZERNY, VINCENZ (1842-). An Austrian surgeon, born at Trautenau, Bohemia. He stud-

ied at Vienna, and until 1871 acted as Billroth's assistant. In the latter year he was made professor of surgery at Freiburg-im-Breisgau, and in 1877 at Heidelberg. He introduced important improvements in operative surgery and published the following works: *Ueber die Beziehungen der Chirurgie zu den Naturwissenschaften* (1872); and *Beiträge zur operativen Chirurgie* (1878).

CZERNY (chěr'ně) **GEORGE** (i.e. Black George) (1766-1817). The leader of the Servians in their struggle for independence, generally known as KARA (Turk. *kara*, black) GEORGE. He was born December 21, 1766, in the neighborhood of Belgrade. In 1787 he was involved in a rising against Turkish rule, but later settled down as a cattle-dealer. In August, 1801, a band of Janizaries broke into his dwelling and plundered it, and in retaliation he collected a band of malcontents, and entered upon a course of guerrilla warfare. Gradually his followers increased; in 1804 he captured the fortress of Shabatz, and subsequently invested Belgrade. In the beginning of 1806 he routed the Turks at the rivers Drina and Morava, and captured Belgrade in December, 1806. The cause of Servia was aided by the war which at this time broke out between Russia and Turkey. After the Treaty of Slobosic (July 8, 1808), Czerny George was elected Governor by the people, and recognized as Prince of Servia by the Sultan. The French invasion of Russia in 1812 compelled the latter country to let Servia shift for itself. Hostilities recommenced; the Turks were successful, and Czerny had to flee to Russia. He afterwards went to Austria, where he lived for some time. Meanwhile the freedom of Servia was secured through the leadership of Milosh Obrenovitch, and in July, 1817, when Kara George returned, intending, as some suppose, to rally his partisans round him for the furtherance of his ambitious schemes, he was murdered at the instigation of Prince Milosh. This was the beginning of a feud between the factions which lasted throughout the greater part of the nineteenth century. Kara George's second son, Alexander Karageorgevitch, was Prince of Servia from 1842 to 1858, but was finally expelled and died in exile in 1885. Consult: Ranke, *Die serbische Revolution* (Hamburg, 1829) translated by Mrs. Keri in Bohn's Library under the title of *A History of Servia and the Servian Revolution* (London, 1853); Denton, *Servia and the Servians* (London, 1862).

CZERNYSCHESKY, chěr'ni-shěv'skâ. See TCHERNYSHEVSKI.

CZERSKI, chěr'skâ, JOHANNES (1813-93). A German divine, one of the founders of German Catholicism. He was born at Warlubien, West Prussia, and was educated at the Priests' Seminary at Posen. Sentenced to penitential confine-

ment for contracting a secret marriage in 1844, he resigned his vicariate in Silesia, and founded an independent community of Catholics, known as the 'Christlich-Apostolisch-Katholische Gemeinde.' Although he maintained his own views, he participated in the struggles of the German Catholics, and upon their downfall devoted himself to quiet religious activity. His most important work is the *Nachlass des sterbenden Papsttums* (12th ed., 1870). He defended his defection from the Orthodox Church of Rome in the work entitled *Rechtfertigung meines Abfalles von der römischen Hofkirche* (1845).

CZOLGOSZ, chōl'gōsh, LEON (1873-1901). A Polish-American anarchist, the assassin of William McKinley, twenty-fourth President of the United States. He was born at Detroit, Mich., and was by trade an iron-worker. He was tried before the criminal term of the State Supreme Court at Buffalo, N. Y., on September 23-24, 1901, and convicted of murder in the first degree. No witnesses were summoned for the defense, but ex-Judge Lewis, of counsel for the prisoner, made a brief address to the jury. The assassin was killed by electricity in the State prison at Auburn, N. Y., on October 29, 1901. See MCKINLEY, WILLIAM.

CZÖRNIG, chěr'nik, KARL, Baron von Czernhausen (1804-89). An Austrian statistician, born at Czernhausen, Bohemia. He studied at Prague and Vienna, and in 1841 became director of the bureau of administrative statistics at Vienna. In 1859 he was appointed chief of the section of railway affairs in the Ministry of Commerce. In 1863-65 he was president of the central statistical commission, organized by himself. He published an ethnographic chart of the Empire (with text), 1855, and other works.

CZUCZOR, tsōō'tsōr, GERELY (1800-66). An Hungarian poet and linguist. He was born at Andód (comitat of Neutra), became a member of the Benedictine Order, and from 1825 to 1835 was a professor successively in the gymnasia at Raab and Komorn. In 1835 he was appointed second secretary and archivist of the Hungarian Academy, by which he was commissioned in 1844 to prepare the great lexicon of the Hungarian language (6 vols., 1861-74). Four volumes were edited by him, the remaining two by János Fogarassy (q.v.). His disregard of the historical and comparative method in philology often impaired the scientific value of his work as a lexicographer, particularly in connection with etymologies. He was imprisoned in 1849 for the publication of his *Riado*, a poem calling Hungarians to action on behalf of their liberties, but obtained his release under the amnesty of 1850. His poems appeared collected in 3 vols. at Pest in 1850.

D

D The fourth letter and third consonant in the Græco-Roman alphabets. Its form is derived by a rounding of the sign Δ found in the West Greek inscriptions rather than from the familiar form of delta (Δ) seen in most Greek scripts. (See ALPHABET; LETTERS.) The Greek name of the letter, *delta*, is a modification of the Semitic word *daleth* (originally *dalt*), which means a door. The Greek capital, Δ , still retains the shape of the opening of a tent, the kind of door most familiar to a nomadic people.

Sound.—In sound the English *d* is a dental or rather alveolar (lingual) voiced explosive, made by a contact of the tip of the tongue and the roof of the mouth near the upper front teeth. In French the contact is rather dental than alveolar. The North German *d* is between the English and the French. There is also in English a slightly more cerebral *d* as in *drown*, made by bending up the tip of the tongue and touching the roof of the mouth farther back than in the so-called dental sound. This is due to its position before the lingual *r*.

Source.—English *d* comes: (1) from Indo-Ger. *dh* (Gk., Lat. *f*, *d* (with *r*), *b*); as *deer*, Gk. $\Theta\acute{\eta}\rho$, Lat. *fera*; *udder*, Skt. *udhar*, Lat. *uber*; (2) from Indo-Ger. *t* when not immediately preceded by the accent; *hund-red*. Skt. *gatam*, Gk. $\xi\acute{\alpha}\rho\acute{\alpha}\nu$, Lat. *centum*; (3) from Germanic *p*, with *t*; *gold*, Goth. *gulþ*; (4) *d* arises as a special development from the affinity of *n* for *d* (as a transfer-sound), in such words as Eng. *gonder*, Lat. *gener*, Eng. *thunder* (OE. *þunor*), *riband* (ME. *riban*). The *d* sometimes disappears as in *cruel* (Lat. *crudelis*). The letter *d* is often assimilated as *affirm*, *accept*, *gossip* (OE. *godsibb*); and in certain linguistic developments it interchanges phonetically with *t*, for example, *t*, Lat. *Ulysses*, from Gk. Ὀδυσσεύς , or with *r* in Lat. *arbiter* from *ad betere*, and *b*, *bellum* from *duellum*. According to Grimm's Law, original *d* becomes *t* in English, *z* in German. Thus Indo-Ger. **dekm*, Eng. *ten*, Ger. *zehn*. *Di* followed by a vowel becomes *j*, as in *journal* from *diurnal*.

As Symbol.—(1) As a numeral, **D** = 500; $\overline{\text{D}}$ = 5000. This use of **D** to denote 500 arose from a confusion with D , the original symbol for that number. (2) In Roman names, **D** = Decimus, Divus, Dominus, and Deus. (3) In academic degrees, **D** stands for Doctor. (4) In music, **D** is the second note of the natural

scale, and is a whole tone above C. It is written in the first added space below the treble clef or on the fourth line; in the bass clef it is on the third line or in the second added space above. (See MUSICAL NOTATION.) (5) In chemistry **D** = didymium. (6) In reckoning English money (£ s. d.), *d* = pence, penny (Lat. *denarius*). (7) In mathematics **D** = derivation, *d* = differentiation, Δ = differencing, and δ = variation.

DAB (probably from *dab*, gentle blow). A fish (*Limanda limanda*) closely related to the plaice and flounder (qq.v.) and sometimes included with them in the same genus. It is common on the sandy shores of northern Europe. It can easily be distinguished from the common flounder by the distinct arch in the lateral line at the anterior end. It attains a length of 12 inches and is much esteemed as food. A nearly related species, the rusty dab (*Limanda ferruginea*), possessing smaller scales, is rather abundant on the eastern coast of North America. There are other less common species of dab.

DAB, DABB, or DHABB (Ar. *dabb*, lizard). A lizard of northeastern Africa, as the common spiny-tailed agamoid *Uromastix acanthinurus*. Two or more species, about a foot in length, are common in Algeria, Tunis, and Egypt; and in Algeria are called 'lézards des palmiers,' perhaps because they eat dates, besides grass, berries, and various flowers. This genus has no voice, and their color, which is very changeable, depends upon the weather, being dull on cool days and much brighter when it is warm. The term is also given to the dried flesh of lizards, especially of the skink (*Scincus officinalis*), preserved for use in medicine among the Arabs.

DAB/BAT (Ar. *dabbat*, reptile). The third sign of the coming of the judgment, the Apocalyptic beast of the Mohammedan religion.

DABCHICK (variant of *dob-chick*, a diving bird, from *dap*, to drop bait into water. AS. *doppa*, a water-bird, from *dypettan*, to dive, from *dypnan*, to dip). A small grebe, as (1) in the United States, the pied-billed grebe (*Podilymbus podiceps*); (2) in England, the little grebe (*Podiceps minor*). See GREBE.

DABNEY, dāb'nī. ROBERT LEWIS (1820—). An American Presbyterian clergyman. He was born in Louisa County, Va., and studied at Hampden Sidney College, at the University of Virginia, and at the Union Theological Seminary

in that State. From 1853 to 1883 he was professor of Church history in the Union Seminary, Virginia, but resigned temporarily during the Civil War, when he first served as chaplain of the Eighteenth Virginia Regiment and later became major and chief of staff to General Thomas J. Jackson. In 1870 he was Moderator of the Presbyterian General Assembly of the South, and in 1883 was appointed professor of moral philosophy in the University of Texas at Austin. In addition to numerous contributions to periodical literature, he published the following: *Life of Gen. T. J. (Stonewall) Jackson* (1867); *Sacred Rhetoric* (Richmond, 1867; 3d ed. 1881); *Defense of Virginia and the South* (1868); *Sensualistic Philosophy of the Nineteenth Century Examined* (1875; 2d ed. 1888); *Theology Dogmatic and Polemic* (1879; 3d ed., 1885).

DABOIA (East Indian). The formerly accepted generic name, which has passed into English, of the very deadly Russell's viper (*Daboia Russellii*). See VIPER, and Colored Plate of VENOMOUS SERPENTS, with article SNAKE.

DABROWSKI, dá-brów'ské, JAN HENRYK. See DOMBROWSKI.

DA CAPO, dá ká'pó (It., from the beginning). A term in music, frequently placed at the end of a phrase or movement, indicating that the performer must return to the beginning of the movement, or to some other part of it usually marked with the sign \S , and finish where the word *fine* is placed. Scarlatti is generally credited with being the first to introduce the use of the *da capo* in his opera of *Teodora* (1693), though it appears that a *da capo* occurs in Teneaglia's opera *Clearco*, as early as 1661. See ARIA. The words are generally abbreviated *D. C.*, sometimes *D. C. al fine*.

DACCA, dák'ká, or **DHAKA**. The capital of the division and the district of the same name in Bengal, British India (Map: India, F 4). It is situated on the left bank of the Burhi Ganga, which connects the Brahmaputra with the Ganges, about 150 miles northeast of Calcutta. The surrounding country is low and overflowed during the rainy season. Many of the old temples and other public buildings are in ruins and give to the city an appearance of decay. Since 1870, however, it has recovered some of its ancient prosperity, and there are now a number of modern public buildings and educational institutions, including a college, modern water-works owned by the municipality, and gas. Prior to the nineteenth century Dacca was a flourishing city of great commercial importance, famous for its muslins, which in the phraseology of the East were characterized as 'flowing water,' 'woven air,' and 'evening dew.' In those days Dacca was filled with magnificent temples and palaces, and its population was estimated at 200,000. The change in the river system of that part of India proved very detrimental to the commerce of the city by depriving it of its facilities for inland navigation, while the invasion of British manufactures almost completely ruined the native textile industry. With the construction of the Dacca-Maimansingh Railway line the trade of Dacca has revived and there is again a demand for the native textile products. Besides textiles Dacca also produces fine silver and gold plate, filigree work, and steel ornaments. There is a considerable trade in ele-

phants. During the seventeenth century Dacca was the capital of Bengal. Population, in 1891, 82,321; in 1901, 90,700.

DACE, DARE, or DART (OF. *dars*, dace, dart, ML. *dardus*; ultimately connected with Engl. *dart*, OIG. *dart*, javelin). A fresh-water fish (*Leuciscus leuciscus*) of the family Cyprinidae, belonging to the same genus as the chub (q.v.), and common in the streams of western Europe. The body is robust and covered with rather large scales; the mouth is rather large. The upper parts are dusky blue, becoming paler on the sides and passing into white on the belly; the cheek and gill-covers silvery white. The dace is gregarious and swims in shoals. They furnish the angler fair sport both with fly and bait, but the flesh is not highly esteemed. The genus includes many other species both in Europe and the United States. In the United States the name is applied to species of various genera of the family, especially *Semnotilus*, of which the best known is the 'horned' dace, or creek-chub (*Semnotilus atromaculatus*), which commonly frequents brooks from the Hudson Valley to that of the Missouri. It grows to a length of ten inches, is bluish above and creamy below, has a vague dusky band on the side, and its dorsal fin always bears a conspicuous black spot at the base in front, bordered with red in the males. It is one of the favorite objects of boys' fishing, and it is a good fish for the aquarium. Several other species of *Semnotilus* occur east of the Rocky Mountains and are called 'chubs,' 'fall-fishes,' etc. See Plate of DACE AND MINNOWS.

DACE'LO (transposed from Lat. *alcedo*, also *alcyon*, Gk. ἀλκυών, *alcyōn*, kingfisher, halcyon). A book name for a genus (*Dacelo*) of Australasian kingfishers, representative of a subfamily (Daceloninae) of kingfishers (q.v.), characterized by their large size, harsh voices, and their adaptations to a forest life and a diet of reptiles and insects. The best known is the laughing kingfisher (*Dacelo gigas*), also called laughing jackass and king-hunter, which is the largest of kingfishers, and widely distributed throughout Australia. "It is an uncouth-looking bird," says Wheelwright, "nearly the size of a crow, of a rich chestnut brown and dirty white color; the wings slightly checkered with light blue after the manner of the British jay; the tail-feathers long, rather pointed and barred with brown. It has the foot of a kingfisher; a very formidable, long, pointed beak, and a large mouth; it has also a kind of crest, which it erects when angry or frightened; and this gives it a very ferocious appearance. It is a common bird in all the forests of Australia throughout the year; breeds in a hole in a tree, and the eggs are white. . . . Its principal food appears to be small reptiles, grubs, and caterpillars. . . . The laughing jackass is the bushman's clock, and, being by no means shy, of a companionable nature, a constant attendant about the bush-tent, and a destroyer of snakes, is regarded, like the robin at home, as a sacred bird in the Australian forests." See illustration of KINGFISHERS.

DACHSHUND, dák'shūnt. A breed of small, long-bodied dogs, formerly employed in central Europe in hunting badgers, but now kept wholly as pets. See HOUND.

DACIA, dā'shī-ā. The land of the Daci or Getæ. Its geographical limits were very indefinite until its conquest by the Romans. After that period it comprised modern Transylvania, with adjacent parts of Hungary, Rumania, and Bukovina. The Getæ came originally from Thrace, and were divided into various tribes. Their course northward can only be imperfectly traced, but we know that shortly before the time of Alexander the Great (B.C. 335) they had migrated across the Danube. It is not known when or for what reason the Getæ changed their name to Daci. They seem to have been the most valiant of the Thracian barbarians. Curio, the first Roman general who ever penetrated as far north as the Danube, did not venture to assail them. Julius Cæsar, however, is said to have contemplated their subjugation. In B.C. 10 Augustus sent an army up the valley of the Maros. From this time there was almost continual fighting between the Romans and the Daci, on the whole to the advantage of the latter, who actually compelled their civilized enemies, in the reign of Domitian, to pay tribute. In A.D. 101 the Emperor Trajan crossed the Theiss, and marched into Transylvania, where he fought a great battle near Torda. The Wallach peasant calls the battlefield, to the present day, *Prat de Trajan* (*Pratum Traiani*, Field of Trajan). The Daci, who were commanded by their famous chief Decebalus, were defeated. A second expedition of the Emperor resulted in the destruction of their capital, the death of Decebalus, and the loss of their freedom (A.D. 106). Roman colonists were sent into the country, a bridge was built over the Danube—the ruins of which are still extant—and three great roads were constructed. The chief towns were Apulum and Sarmizegetusa. In A.D. 270-75 the Romans abandoned the country to the Goths, and the colonists were transferred to Mesia.

DACIER, dā'syá', ANDRÉ (1651-1722). A French philologist. He was born of Protestant parents at Castres, in Upper Languedoc, studied at Saumur, and in 1672 came to Paris, where he was employed to bring out, for the use of the Dauphin, an edition of the Latin writer *Festus*, which he published in 1681. In 1683 he married Anne Lefèvre, also a Protestant, and two years later both entered the Roman Catholic Church. Dacier subsequently became royal librarian, member of the Académie des Inscriptions, and perpetual secretary of the 'Académie.' He died September 18, 1722. Dacier's principal works, besides his *Festus*, are *Œuvres d'Horace en Latin et en Français* (Paris, 1681-89), an edition of Valerius Flaccus, and numerous translations into French of Greek authors, such as Plutarch and Epictetus, all of which, in spite of his erudition, are of mediocre quality, while the expositions and criticisms are shallow.

ANNE DACIER (1654-1720). The wife of the preceding. She was born at Saumur, and after the death of her learned father, who had developed her talent, came to Paris, where she acquired such a reputation by her edition of Callimachus (1674) that the Duke of Montausier commissioned her to edit several of the ancient authors for the use of the Dauphin. Similarity of tastes and employment led to a marriage between her

and André Dacier. Her domestic duties did not, however, weaken her literary ardor. Besides editing a number of the classics, she translated the comedies of Terence; the *Amphitryon*, *Epidicus*, and *Rudens* of Plautus, accompanied by an able dissertation on the origin, progress, and mutations of dramatic poetry; Anacreon, Sappho, and the *Plutus* and *Clouds* of Aristophanes. Her admiration of Homer was unbounded, and involved her in two learned controversies. Madame Dacier is generally acknowledged to have possessed a more acute and vigorous mind than her husband. She died August 17, 1720.

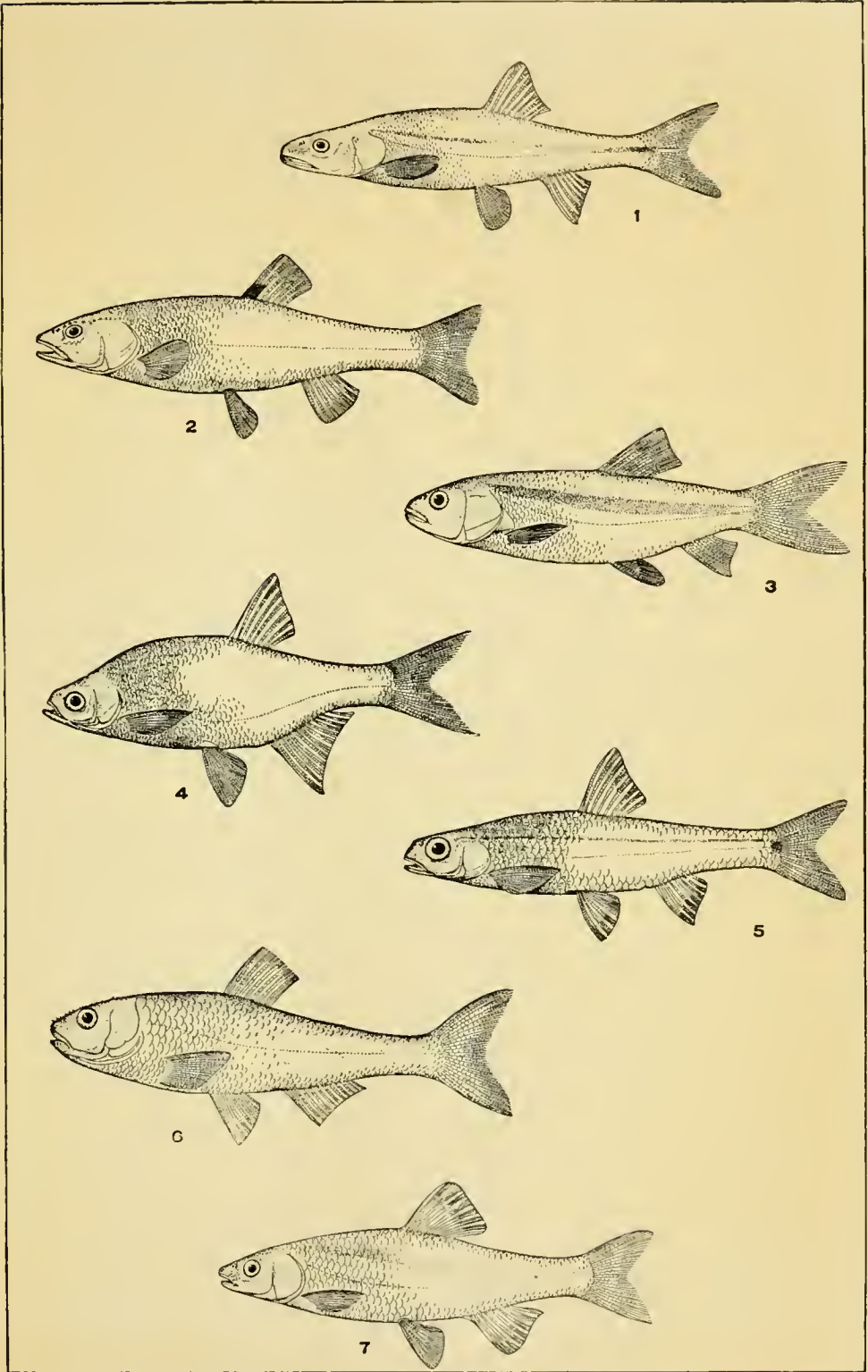
DA'CITE. A volcanic rock of generally porphyritic texture, characterized by the occurrence of lime-soda feldspar, and generally also by quartz and by mica, hornblende, or pyroxene. These minerals are imbedded in a ground mass or matrix of rock glasses or of a finer-grained aggregate of crystals. The color of the rock is generally gray, but under prolonged weathering it may become brownish. The newer or younger dacites are, therefore, in contrast with the older, much less brown in color. The average chemical composition of dacite is: silica, 68 per cent.; alumina, 17 per cent.; ferric oxide, 2 per cent.; ferrous oxide, 1.5 per cent.; magnesia, 1.5 per cent.; lime, 3 per cent.; soda, 4 per cent.; potash, 3 per cent. Dacite differs from andesite (q.v.) principally in its higher percentage of silica, due to the presence of quartz and a greater abundance of the light-colored mineral constituents. The name dacite has been given because of the great development of this type of rock in Dacia, an ancient Roman province comprising part of modern Hungary and vicinity. Many recent as well as more ancient volcanic lavas are dacite. Dacite graduates into trachyte, rhyolite, and diorite (qq.v.).

DACOITS' (Hind. *dakait*, *dākāyat*, robber, *dākā*, attack by robbers, from *dākūā*, to shout). The name given to bands of men in India who live by robbery. They resemble the thugs (q.v.) in that a slight religious element seems to enter into their conduct, but plunder, and not murder, is their guiding motive. On the whole, they are a national type of banditti, closely resembling the brigands of Sicily or Greece. Driven out by the British Government from Hindustan, they are still fairly active in Burma. Technically, dacoity in British-Indian law means the conspiring of five or more men to engage in any act of theft.

DACOSTA, dā-kō'stā, GABRIEL. See ACOSTA, GABRIEL.

DA COSTA, ISAAC (1798-1860). A Dutch poet and Protestant theologian, born in Amsterdam. He studied at Leyden, in 1818 received the degree of LL.D., and that of Ph.D. in 1821. Though by parentage he was a Portuguese Jew, he embraced Christianity in 1822, and became a professor and director of the Free Scotch Church Seminary. He was an effective public lecturer. The friend of Bilderdijk, the latter's poetic mantle fell upon him, and he was thenceforth esteemed the greatest of Holland's poets. The more noteworthy of his volumes of verse are: *Prometheus* (1820); *Poems* (1821-22); *Festive Songs* (1828); *Haar* (1840); and *The Battle of Nieuwpoort* (1859). Da Costa translated Byron's *Cain*, and, as a theologian, produced a *Gospel Harmony* and *Israel and the Gentiles*,

AMERICAN DACE AND MINNOWS



1. SQUAWFISH (*Pytocheilus Oregonensis*).
2. CREEK CHUB (*Semotilus atromaculatus*).
3. UTAH CHUB (*Leuciscus lineatus*).

4. GOLDEN SHINER (*Abramis chrysoleucas*).
5. SPOT-TAILED MINNOW (*Notropis Hudsonius*).
6. HORNED DACE (*Notropis cornutus*).
7. SILVER-FIN (*Notropis Whipplei*).

both translated. He died at Leyden, April 28, 1860.

DACRÈS, dāk'kērz, JAMES RICHARD (1788-1853). An English naval officer, born at Lowestoft. He entered the navy in 1796, accompanied the expedition sent against Ferrol, and in 1806 was placed in command of the sloop *Bacchante*. After distinguished service, he was in 1811 transferred to the *Guerrrière*. Upon the loss of that vessel in the famous contest with the *Constitution*, he was taken aboard the latter, and subsequently paroled at Boston. By the court-martial assembled in 1812 at Halifax, he was honorably acquitted of all blame for the surrender of his vessel. In 1815, while commanding the *Tiber*, he captured the *Leo*, an American privateer. He became a rear-admiral in 1838, and in 1845 commander at the Cape of Good Hope.

DACRES, Sir SYDNEY COLPOYS (1805-84). An English admiral. He was captain of the flagship of the Channel fleet under Sir Charles Napier from 1847 to 1849, and as commander of the *Sans Parcil* took a prominent part in the bombardment of Sebastopol. As rear-admiral, to which position he was appointed in 1859, he later commanded the first ironclad squadron. He was second in command on the North American station during the controversy over the Trent affair (1861). In 1868 he was appointed senior lord of the admiralty, and in 1872 commander of Greenwich Hospital.

DACRYDIUM (Neo-Lat., from Gk. δακρυδιον, *dakrydion*, dim. of δάκρυ, *dakry*, tear; referring to the drops of gum exuded by the tree). A genus of lofty trees of the natural order Taxaceæ, which has the male and the female flowers on separate individuals. The species are chiefly natives of Australia and New Zealand. *Dacrydium Franklinii* is called Huon pine, although rather a yew than a pine. Its timber is harder than any Baltic pine, and is excellent for spars for naval purposes. The tree attains a height of a hundred feet, and a diameter of six feet. The wood is light, tough, and very durable. It is said to be one of the best Australian woods for carving. *Dacrydium cupressinum* and *Dacrydium Kirkii* are two species occurring in New Zealand, where they are large trees of considerable economic value. The drupes of both species are edible. The young twigs of *Dacrydium cupressinum* are sometimes used for making a kind of beer. Closely related are the species of *Podocarpus*, of which there are a score or more species in Asia and through the islands of Australia. *Podocarpus totara* is the most valuable timber-tree of New Zealand, where it attains a height of 60 to 100 feet and a diameter of 6 to 8 feet. The bark is extensively used for roofing houses. *Podocarpus spicata* and *Podocarpus excelsa* are other species of value.

DACTYL (Lat. *dactylus*, Gk. δάκτυλος, *daktylos*, finger). The name of a measure or 'foot' in Greek and Latin versification. It consists of one long and two short syllables, as in the word *omnibus*, and was so called from its resemblance to the finger, which consists of three joints—one long and two short. The same name is applied to a trisyllabic measure in English verse, consisting of one accented syllable and two unaccented syllables, as in *destiny*. (See VERSIFICATION.)

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Dactylic verses consist of dactyls and equivalent feet. See HEXAMETER.

DACTYLIS. See ORCHARD GRASS.

DACTYLOLOGY (from Gk. δάκτυλος, *daktylos*, finger + -λογία, *-logia*, reasoning, from λέγειν, *legcin*, to say). The art of communicating thought by the fingers. See DEAF MUTE.

DACTYLOMAN'CY. See SUPERSTITION.

DACTYLS, DACTYLI, DAK'TYLOI. In Greek legend, a supernatural folk who dwelt on Mount Ida in Phrygia. They were the discoverers of copper and iron, and were deeply versed in the metal-working arts. The legends later transferred them to the Cretan Mount Ida, and identified them with the Corybantes. They were originally three in number—Kelmis, the Smelter; Dammameneus, the Hammer; and Aemon, the Anvil; then were increased to five, ten, fifty-two, and at last one hundred.

DADAYAG, dā'dā-yāg'. A head-hunting Malayan people in the mountains of Cagayan Province, Luzon. Their speech is separate. See PHILIPPINES.

DADDY-LONG-LEGS. (1) In the United States, the long-legged, spider-like creatures of the arachnid family Phalangida. (See HAN-YESTMAN.) (2) In England, the flies of the family Tipulidæ, which includes the crane-flies—big, long-legged insects, resembling exaggerated mosquitoes, that swarm in late summer in grassy and bushy places. The eggs are not known. The larvæ of some live in damp earth, decaying wood, etc., and of others in the water, feeding on vegetable material, diatoms, etc. One curious wingless genus (*Chionea*) contains the 'snow-insect' occasionally seen in swarms on the surface of snowbanks. Some of the earth-inhabiting forms injure the roots of grain and other grasses. More than a thousand species have been described.

DA'DO (It., a die). In architecture, the term applied to the cubic block which forms the body of a pedestal. It is also applied to the plane face and the series of moldings which, in the interiors of buildings, form, as it were, a continuous pedestal. The ordinary modern interior dado is formed of wood, and, running round the bottom of the walls of a room, serves to protect the plaster or paper from injury. It is generally about three feet in height, and surmounted by a narrow cornice. It is also called a wainscot, though this name is more properly applied to a paneled dado.

DADOXYLON (Neo-Lat., from Gk. δάξ, *das*, torch + ξύλον, *xylon*, wood). Fossil wood of Paleozoic age, found in the Devonian rocks of Europe and America, and having a microscopic structure like that of Cordaites wood and Araucaria wood. See CONIFERÆ; CORDAITES.

DÆDALUS (Lat., from Gk. Δαίδαλος, *Daidalos*, literally 'the cunning worker'). The mythical sculptor, placed by Greek legend at the beginning of native art, to whom were attributed many early wooden statues, apparently of the type of the early nude male figures, such as the "Apollo of Oreomenos." The early forms of the legend seem to have made him a native of Crete, and there seems to have been an early school of Cretan artists, the Dædalidæ, who claimed him as their ancestor. Under Athenian influ-

ences, however, the more common forms of the myth arose. Dædalus was a descendant of the Athenian royal race, the Erechthidæ, and having killed his pupil Talos, fled to Crete, where he was received by King Minos, for whom he built the Labyrinth for the Minotaur, and for Pasiphaë (q.v.), the wooden cow. To escape the wrath of Minos, he fitted wings to his son, Icarus, and himself, and fled across the sea. Icarus flew too near the sun, the wax which fastened the wings melted, and he was drowned in the Icarian Sea. Dædalus escaped to Italy, where he built the Temple of Apollo at Cumæ, and then crossed to Sicily, where local legend attributed to him many architectural works. It seems useless to seek any historical basis for the story of Dædalus, though it is very probable that Crete exercised an important influence on early Greek art. Consult: Kuhnert, *Dædalus* (Leipzig, 1886); Potier, in Daremberg and Saglio, *Dictionnaire des antiquités* (Paris, 1873); and Robert, "Die Daidaliden," in *Archäologische Märchen* (Berlin, 1886).

DÆDALUS OF SICYON, sish'i-on. A Greek sculptor, who lived in the first half of the fourth century B.C., probably the son and, according to Pausanias, also a pupil of Patrocles of Sicyon. His earliest work mentioned was a "Trophy," erected at Olympia by the Eleians to commemorate a victory over the Lacedæmonians. His other productions include the "Cowering Venus," probably the prototype of the familiar copies in the Louvre and Vatican Museums, the figures of "Two Boys Using the Strigil," and the portrait statues of several of the victors in the Olympian games.

DÆDICU'RUS. See GLYPTODON.

DÆMON'ELIX (Neo-Lat., from Gk. *δαίμων*, *daimōn*, demon + *ἑλίξ*, *helix*, spiral). A problematic fossil found in great numbers in the sandstones of the Loup Fork Tertiary of northwestern Nebraska and adjacent portions of Wyoming, and known to the ranchmen of the vicinity by the name of 'Devil's cork-screws.' The fossil ranges through a thickness of about 250 feet of sandstones and varies in form from delicate fibrous structures in the lowermost beds, through cylindrical, spherical, cake-like, and irregularly twisted forms in successively higher horizons, till in the uppermost beds it assumes the form of a vertical left- or right-handed spiral spring, 2 to 10 feet high, with or without a central axis, and usually with a more or less curved fusiform or cylindrical 'trunk,' 3 to 20 feet long, that rises obliquely from the base of the spiral. The fibrous forms penetrate the sandstone and are also found traversing the surfaces of skulls and bones of fossil mammals entombed in the same beds. The spiral screws are wonderfully regular in their proportions, both as to the angle of pitch of the spiral and as to the increase in diameter of the same from bottom to top. The whole mass of the fossil consists of an aggregation of twisted plant-fibres, which on examination with a microscope prove to have a simple cellular structure like that of parenchyma tissue. This cellular structure has been found in all parts of the fossil, and clearly indicates its vegetable nature. The beds in which the Dæmonelix is found are of lacustrine origin, and it is possible that the fossil is of algal affinity. Prof. E. H. Barbour, the discoverer of Dæmonelix, has

described it fully in a paper on the "Nature, Structure, and Phylogeny of Dæmonelix," in the *Bulletin of the Geological Society of America*, vol. viii. (Rochester, 1897).

DAENDELS, dän'dêls, HERMAN WILLEM (1762-1818). A Dutch general. He was born at Hattem, in Gelderland, where he practiced law and took part in the revolutionary disturbances that broke out in 1787. Compelled to seek refuge in France, he rendered important service to Dumouriez in 1793, in the latter's campaign against Holland, was made brigadier-general, and, after the proclamation of the Batavian Republic, entered its service as lieutenant-general. In 1799 he commanded a division of the Republican army, which compelled the Anglo-Russian forces to surrender. Hostile intrigues induced him to leave the service in 1803, but at the outbreak of the war in 1806 he was reinstated in his former rank by the King of Holland, and served against the Prussians. He now occupied East Friesland, and became successively Governor of Münster, commander-in-chief of the Dutch cavalry, marshal of Holland, and Governor-General of the Dutch East India possessions. This last office he held from 1808 to 1811, and discharged his duties with great ability and prudence. He participated in the Russian campaign of 1812-13, and distinguished himself by his stalwart defense of Modlin. On the overthrow of Napoleon, his services were secured by the new King of Holland, William I., who intrusted him with the organization of government in those colonies on the west coast of Africa which had been restored to the Dutch. In this capacity he labored with energy and success until his death. The work he published (1814) on his administration of Java was an important contribution to our knowledge of that island.

DAET, dâ-ät'. A town of Luzon, Philippines, in the Province of North Camarines. It is situated near the coast, 50 miles northwest of Nueva Cáceres. Population, in 1898, 10,650.

DAFFODIL. See NARCISSEUS.

DAGAMI, dâ-gâ'mê. A town of Leyte, Philippines, 20 miles from Tacloban. It is situated in a plain, near the eastern coast of the island. Population, in 1898, 25,000.

DAGE, dâ'ge, EDUARD (1805-83). A German painter, born in Berlin. He received his artistic training at the Academy of Berlin and under Wachs. From 1861 until his retirement in 1875 he was acting director of the Royal Academy at Berlin. He executed some religious works, including frescoes in the chapel of the Schloss in Berlin. But he was more successful with genre and ideal subjects, such as "The Discovery of Painting" (1832; National Gallery, Berlin) and "The Compassionate Monk" (1836).

DAGGER (Icel. *daggardr*, dagger, from Ir. *daigear*, Welsh *dagr*, dagger, from Bret. *dag*, OGael. *daga*, knife). A short sword, or two-edged, sharp-pointed knife. It is one of the oldest forms of the *arme blanche*, and has its modern representative in the infantry sword-bayonet. (See BAYONET.) In the Middle Ages soldiers often fought with sword or rapier and dagger, the latter being held in the left hand. (See FENCING.) The dagger proper has ceased to be part of the modern military equipment,

except by some of the native or tribal troops of the British and Russian empires.

The dirk, practically a dagger, is still carried by the Highlanders of the British Army, but only as an ornamental part of their national dress. The American bowie-knife (q.v.) is in effect a dagger.

DAGGER-MOTH. A moth of the noctuid genus *Acronyeta*, so named because of dagger-shaped marks on the wings.

DAGGERWING. One of the small, slender-tailed North American butterflies of the nymphalid genus *Timetes*.

DAGHESTAN, *dä'ge-stän'* (Pers., place of mountains, from Turk. *dagh*, *tagh*, mountain + Pers. *stän*, OPers. *stāna*, place, from *stā*, Skt. *sthā*, to stand). A province of Transcaucasia, Russia, bounded by the Caspian Province of Terek on the north, the Caspian Sea on the east, Baku on the south, and the Caucasus mountain chain on the west (Map: Russia, G 6). Area, 11,332 square miles. A large portion of the territory belongs to the region of the Caucasus Mountains. The coast land is mostly level. Numerous short mountain streams cross Daghestan and fall into the Caspian Sea. There are a number of hot springs. The climate is moderate. In the lower portions of the territory some grain and fruit are raised. The mountains are well wooded. Sulphur is practically the only mineral worked. Cattle-raising receives much attention. The commerce is insignificant, and the transportation facilities inadequate. The population, in 1897, was 586,636, consisting mostly of Lesghians, Avars, and other Caucasian tribes. The Turkish Tatar element is, however, not unimportant. The Russians number about 10,000, and the Jews are about equally numerous. The natives are chiefly Mohammedans, and the educational facilities are very meagre.

The seat of the provincial government is Temir-Khan-Shura, and the chief commercial centres are Derbent and Petrovsk (q.v.), both on the coast. Until 1812 Daghestan formed a province of Persia, although the inhabitants enjoyed partial independence under native khans, and manifested their opposition to Persian rule by periodic revolts. It then passed into the nominal possession of Russia, whose authority was not established until after a fierce struggle of many years. Daghestan still continued to be ruled by native khans until 1868. The last outbreak of the natives against Russian rule occurred during the Russo-Turkish War in 1877.

DAGNAN-BOUVERET, *dä'nyän' bōō'v'rá'*, PASCAL ADOLPHE JEAN (1852—). A French painter, born in Paris, January 7, 1852. He studied under Gérôme, and won his first important success with his Salon picture of 1870, "A Wedding at the Photographer's." In 1882 appeared "The Nuptial Benediction," and in 1884 "The Horse Pond," which is in the Luxembourg. "The Consecrated Bread" (1886) admirably displays his management of light in interiors, and the subject of the picture is painted with a sentiment that is poetic, yet quiet and serene. His work shows poetic feeling and patient labor. Bouveret was made Chevalier of the Legion of Honor in 1885, and received the first medal at the Salon of 1899 for his "Breton Women at the Pardon." Consult: Mrs. Arthur Bell, *Rep-*

resentative Painters of the Nineteenth Century (New York, 1899); Stranahan, *A History of French Painting* (New York, 1899); *Modern French Masters*, Van Dyke, ed. (New York, 1896).

DAGÖ, *dä'gö*, or **DAGDEN**, *däg'den*. An island in the Baltic Sea, belonging to the Russian Government of Esthonia. It lies north of the island of Osel, is quadrilateral in shape, and covers an area of 370 square miles (Map: Russia, B 3). The surface is mostly low land, partly covered with marshes. Fishing and farming are the main industries. Population, in 1897, about 14,000, composed of Esthonians, Swedes, and Germans. Dagö belonged to Denmark until 1645, when it was acquired by Sweden, and was annexed to Russia in 1721.

DA'GO. A name originally given by sailors to Spaniards, Portuguese, and Italians in general. It is asserted to be a corruption of the Spanish name Diego, equivalent to the English name 'James,' or 'Jack.' By others it is a title given exclusively to those born of Spanish parents. By others, again, it is thought to be purely a corruption or nickname derived from *hidalgo*, which came to be applied to any for-eigner from Latin Europe. Whatever the derivation of the word may have been, it is applied chiefly to the lower class of Italian immigrants in America.

DAG'OBERT, *Fr. pron. dä'gö'bär'*, I. (? - 638). King of the Franks, son of Cloaire II. He ruled in Austrasia from 622 to 632, and in Neustria and Burgundy from 628 to 638. In 632 he gave Austrasia to his son Sigibert.

DAGOBERT, **CHANSON DU ROI** (Fr., song of King Dagobert). A French song, in which the characters are King Dagobert and Saint Eloi, his counselor. It became very popular as a political song; the couplets being altered to fit different political conditions. A notable version which sprang up in 1814, aimed at Napoleon, was suppressed by police regulations.

DA'GON. A god of the Philistines, and perhaps also of the Phœnicians. The references to this god in the Old Testament are too few and our knowledge of Philistine religion too scanty to enable us to identify the god. There was a temple dedicated to him at Gaza (Jud. xvi. 23) and another at Ashdod (I. Sam. v. 2, etc.). From the description in the latter passage it would seem that Dagon had a head and hands, but the shape of his lower extremities is in doubt. Kimchi says that he was half man, half fish, but this may be due to the etymological explanation of *Dagon* from Hebrew *dag*, fish. *Dagon*, however, can also be compared with *dagan*, corn, and the god would thus become an agricultural god, which is much more probable. It has been supposed by some that the man-fish figures on Assyrian monuments represent Dagon, but there is no warrant for this hypothesis. The figure in question is the Assyro-Babylonian god Ea, a water deity whose seat of worship was originally at Eridu, on the Persian Gulf. There is, however, a god Dagon who is associated with Anu, the god of heaven. It is not impossible that Dagon is a foreign deity introduced into Assyria and whose original character is there lost sight of. I. Sam. v. 5 mentions that the priests and worshippers never stepped on the threshold of the temple of Ashdod. Consult:

Menant, "Le mythe de Dagon," in the *Revue de l'histoire des religions*, vol. xi. (Paris, 1886).

DAG'ONET, SIR. King Arthur's fool, in the "Round Table" legends. The Elizabethan dramatists frequently allude to him as a type of the court jester.

DAGUERRE, dā'gār', LOUIS JACQUES MANDÉ (1789-1851). A French painter and physicist, born at Corneilles, Seine-et-Oise. He first became a scene painter under Degoti, and was so successful in this art that he began to paint extensive panoramas, and finally evolved the diorama, which attracted much attention. About 1829 he began to interest himself in the discoveries which became famous under his name. He entered into a correspondence with Nicéphore Niépce, who had been studying in the same direction since 1814. Together they invented the art of photography on metal, the well-known daguerreotype process, the improvement of which was to result in modern photography. Before the completion of their experiments Niépce died. In 1839 the discovery was made known, and immediately its value was appreciated. Daguerre was given a pension of 6000 francs and made a member of the Legion of Honor. While he was still laboring to bring his work nearer perfection he died suddenly at Petit-Brie-sur-Marne, near Paris. He wrote the following volumes descriptive of his inventions: *Historique et description des procédés du daguerreotype et diorama* (1880) and *Nouveau moyen de préparer la couche sensible des plaques destinées à recevoir les images photographiques* (1844). Consult Ernouf, *Les inventeurs du gaz et de la photographie* (Paris, 1885). See **DAGUERREOTYPE PROCESS**; **PHOTOGRAPHY**.

DAGUERREOTYPE (dā-gēr'ō-tīp) **PROCESS** (Fr. *daguerreotype*, from *Daguerre* + Gk. *τύπος*, *typos*, impression). The original photographic process, as introduced by its inventor, Daguerre, in 1839. The pictures are positive or direct, though they appear as negative when viewed at certain angles, and are the result of the successive action of the vapors of iodine, bromine, and mercury upon a highly polished surface of chemically pure silver. The manipulations involved in conducting the process are: (1) cleaning and polishing the plate; (2) rendering the plate sensitive; (3) exposing it in the camera; (4) developing the latent image; (5) fixing the picture.

A copper plate of moderate thickness is first coated with silver by electro-plating and polished as highly as possible; it is then exposed first to the vapor of iodine, and then to the vapor of bromine for a length of time, ascertained in practice by watching the succession of prismatic colors which begin to appear with the first contact of the vapor. The plate is then exposed in a camera, and the development of the latent image, which is the next operation, is effected by subjecting the plate to the action of the vapor of mercury, which attaches itself to the various parts of the picture in proportion as it has been acted on by the light. Those portions of iodide and bromide of silver unaffected by light are next removed by immersing the plate in a solution of hyposulphite of soda; and the picture is subsequently fixed and intensified by pouring over its surface a solution of hyposulphite of soda and chloride of gold, and applying heat;

by which means it is coated with a thin film of metallic gold, and thereby rendered so permanent that it requires a chemical solvent for its removal. It may be mentioned in conclusion that though Daguerre published in 1839 the first practicable process for taking pictures by the agency of light, his experiments would seem to have been suggested by the researches of Niépce, who, about 1820, obtained impressions on silver plates rendered sensitive by being coated with asphaltum saturated with oil of lavender. See **PHOTOGRAPHY**.

D'AGUESSEAU, dā'gēs'sō'. See **AGUESSEAU**.

DAGUPÁN, dā'gōō-pān'. A town of Luzon, Philippines, in the Province of Pangasinán, situated eight miles from Lingayen, near the Gulf of Lingayen (Map: Luzon, C 2). It is the terminal of the Manila-Dagupán Railway. The surrounding region, generally level, is very fertile. Population, in 1898, 16,000.

DAHABEAH, dā'hā-bē'ā (Ar. *dahabiya*, from *dhababa*, to go). The name given to barges on the river Nile, much used by tourists, to whom they are hired by the week. They resemble in their conveniences and comforts the houseboats so popular on English rivers.

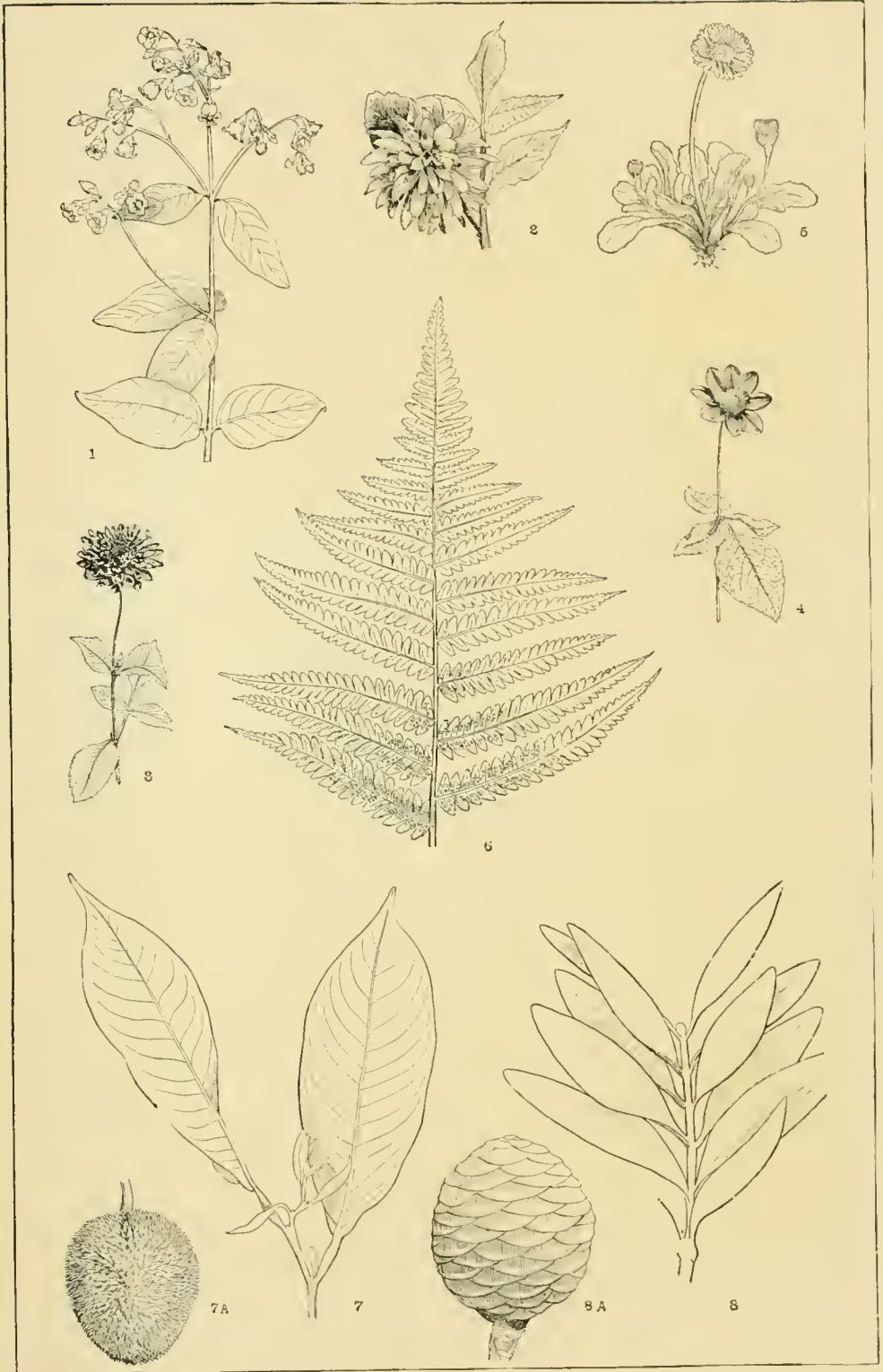
DAHL, dāl, JOHANN KRISTEN CLAUSEN (1788-1857). A Norwegian landscape painter, born at Bergen, February 24, 1788. His parents wished him to enter the Church, but he was determined to study art, and in 1811 entered the Academy at Copenhagen. In 1818 he entered the Academy at Dresden, and in 1821, after his return from Italy, he was made professor there. He was a pioneer in Norwegian landscape. Though very rugged in style, he painted with a hard and dry effect. In spite of this, he stood in the front rank of his contemporaries, especially between the years 1820 and 1830. He died at Dresden, October 14, 1857. Among his most prominent works are: "Danish Coast by Moonlight" (1828); "Storm at Sea" (1823); "Great Norwegian Landscape" (1850); and "Winter Landscape." Consult Aubert, *Maleren Professor Dahl 1788-1857* (Kristiania, 1892-94).

DAHL, VLADIMIR IVANOVITCH (1801-72). A Russian author, born in Lugansk (Government of Ekaterinoslav). He was educated at Dorpat, and in 1828-31 accompanied the Russian army in a medical capacity in the Turkish and Polish campaigns. Subsequently he was a Government official at Orenburg. His studies in Russian ethnography and philology are valuable, in particular his *Dictionary of Existing Russian Dialects* (4 vols., 1861-68; 2d ed. 1882). His works in belles-lettres were collected at Saint Petersburg in 1860-61 (8 vols.).

DAHLAK, dā-lāk', or **DAHALAK**, dā'hā-lāk'. An archipelago (a dependency of Italy) just off Massawa, Abyssinia, consisting of a number of islands of coral, rock, and sand (Map: Africa, H 3). Three only have a permanent population. The entire area is about 420 square miles, the larger portion of which is taken up by the main island, Dahlak-el-Kebir, 32 miles long and 18 wide. The chief occupation is fishing for pearls and sponges. Domestic animals are raised to some extent. The permanent population is about 1500, mostly Abyssinians.

DAHLBERG, dāl'bērg, ERIK, Count (1625-1703). A Swedish military engineer, born in

DAHLIA ETC.



1. DOGBANE (*Apocynum androsæmifolium*).
 2. CACTUS DAHLIA (*Dahlia juarezii*).
 3. SHOW DAHLIA (*Dahlia* sp.).
 4. SINGLE DAHLIA (*Dahlia* sp.).
 5. ENGLISH DAISY (*Bellis perennis*).

6. MALE FERN (*Aspidium Filix-mas*). Tip of frond showing a portion of the sori.
 7. DURIAN LEAVES (*Durio zibethinus*).
 7a. DURIAN FRUIT, much reduced.
 8. DAMMAR (*Agathis Dammara*).
 8a. CONE OF DAMMAR.

Stockholm. Under Charles XI. he became director of fortifications. He rebuilt most of the works then existing with such skill as to be called the 'Vanban of Sweden.' He was appointed a royal counselor, a field-marshal, and in 1696 Governor of Livonia. Consult Schlözer, *Schwedische Biographien* (vol. i, Altona, 1760).

DAHLGREN, däl'grën, FREDRIK AUGUST (1816-95). A Swedish poet, born at Nordmark, August 20, 1816. He is the author of many popular dialect songs and ballads (3 vols., 1876) and of some successful dramas, of which *Vermålandingarne* (1846) is most noteworthy. He was also a facile translator for the theatre and wrote a history of the Swedish stage.

DAHLGREN, däl'grën, JOHN ADOLF (1809-70). An American naval officer, prominent on the Federal side during the Civil War. He was born in Philadelphia of Swedish parentage; entered the United States Navy as a midshipman in 1826; cruised for a time on the *Macedonian* and the *Ontario*; and from 1834 to 1838 was engaged in the United States Coast Survey work, for which his aptitude and training in mathematical studies had well fitted him. In 1837 he was promoted to the rank of lieutenant, but in the same year was forced by failing eyesight to leave the active service, and did not resume his duties until 1842. After a cruise of two years in the Mediterranean on board the *Cumberland*, he was assigned to the Ordnance Department, which absorbed the greater part of his energies from this time on, and of which he was twice chief—in 1862-63 and in 1868-70. In his many years of service he greatly increased the efficiency of the department and became especially well known through his invention (1850) of the Dahlgren gun, which proved of the utmost value to the Government during the Civil War. In April, 1861, on the defection of Franklin Buchanan (q.v.), he succeeded that officer as commandant of the Washington Navy Yard, a position which he held until the fall of 1862, when he became chief of the Bureau of Ordnance. In February, 1863, he was raised to the rank of rear-admiral, and in July replaced Admiral Dupont as commander-in-chief of the South Atlantic blockading squadron, the greater part of which was engaged in the siege of Charleston, S. C. Soon after taking command, he, in coöperation with General Gilmore, the commander of the Federal troops near Charleston, succeeded in capturing Morris Island, silencing Fort Sumter, and completing the closing of the port. Finally, in February, 1865, Charleston was evacuated by the Confederates, and Dahlgren occupied Charleston Harbor, while General Schimmelpfennig took possession of the city. Soon afterwards he resigned as commander of the South Atlantic squadron, and from 1866 to 1868 commanded the South Pacific squadron. After finishing his second term as chief of the Bureau of Ordnance, he was placed in command, at his own request, of the United States Navy Yard in Washington, where several months later he died. In addition to many reports and magazine articles, he published: *Thirty-two-Pound Practice for Ranges* (1850); *Systems of Boat Armament in the United States Navy* (1852); *Naval Percussion Locks and Primers* (1852); *Ordnance Memoranda* (1853); *Shell and Shell Guns* (1856); and an uncompleted volume entitled *Notes on Maritime and*

International Law was published posthumously in 1877. Consult Madeleine V. Dahlgren (his widow), *Memoir of John A. Dahlgren* (Boston, 1882).

DAHLGREN, däl'grën, KARL FREDRIK (1791-1844). A Swedish humorist and poet whose ballads and songs are widely sung. He was born near Norrköping, June 20, 1791. Descriptions of natural scenes and the burlesque idyll are his fortes. Like Hood, whom in many ways he resembled, he published for some years an annual, *The Muscs' Almanac*, as a receptacle for his stories and comic sketches. His sole novel, *Nahum Fredrik Bergströms krönika* (1831), is excellent. He died at Stockholm, May 2, 1844.

DAHLGREN, däl'grën, MADELEINE VINTON (1835—). An American author, wife of Admiral J. A. Dahlgren, born in Gallipolis, Ohio. Under the name of "Corinne," and later that of "Cornelia," she wrote many sketches and poems. She was one of the founders of the Literary Society of Washington, and at one time its vice-president. A list of her works includes the following: *Idealities* (1859); *South Sea Sketches* (1881); *Etiquette of Social Life in Washington* (1881); *South Mountain Magic* (1882); and *Lights and Shadows of a Life* (1886). She also rendered from the Spanish Donoso Cortes's *Catholicism, Liberalism, and Socialism*, and from the French the *Pius IX.* of Montalémbert and the *Executive Power* of De Chambrun (1874), with a preface by James A. Garfield.

DAHLGREN GUN. The type of gun designed by Admiral Dahlgren after a series of experiments to determine the pressures at different parts of the bore. They were introduced into the Navy in 1852 and were in general use during the Civil War. See BALLISTICS; GUNS, NAVAL; ORDNANCE.

DAHLIA, däl'yä or däl'yä (Neo-Lat.). A genus of large perennial herbaceous plants of the natural order Compositæ, natives of Mexico. Most of the varieties in cultivation are derived from the species *Dahlia variabilis* and *Dahlia Juarezii*, the latter being the parent of the cactus forms. Dahlias were first brought to Madrid by Spanish botanists in 1789. The name was given in honor of Dahl, a Swedish botanist. The dahlia varies greatly under cultivation. Some 3000 varieties have been catalogued. Most of these have been the showy and fancy kinds with spherical, symmetrical flowers differing mainly in color. The cactus or decorative types are more chrysanthemum-like in form. Their introduction within recent years has done much to increase the popularity of the dahlia. The dahlia possesses a wide range of colors and lacks practically only sky-blue and kindred shades. It is propagated by division of the root, cuttings, and seed. The first method is that of the amateur, the second that of the commercial grower, and the last is used in the production of new varieties. In gardens the roots are planted 18 to 36 inches apart in any good soil and require ordinary cultivation. In the fall the roots are dug and stored in the cellar like potatoes.

A beetle injurious to dahlias (*Diabrotica 12-punctata*) is illustrated under CORN-INSECTS.

DAHLMANN, däl'mán, FRIEDRICH CHRISTOPH (1785-1860). A German historian and statesman, born May 13, 1785, at Wismar. His earlier studies in Copenhagen and Halle were devoted to archaeology and philology, but his attention was subsequently directed to political science and history. In 1812 he was made a professor in the University of Kiel, and in 1815 became secretary of the permanent committee of the Schleswig-Holstein clergy and nobility, in which capacity he opposed the Danish policy concerning those duchies. He published several historical works, and in 1829 was appointed professor of political science in Göttingen, where he published his valuable work, *Quellenkunde der deutschen Geschichte* (1st ed. 1830; reëdited by Weitz, 1875, and subsequent editions). Dismissed from the university in 1837, with six of his colleagues, by King Ernest Augustus, on account of their protest against the abrogation of the Hanoverian Constitution, he went to Leipzig and afterwards to Jena, where he wrote his admirable *Geschichte von Dänemark* (Hamburg, 1840-43). In 1842 he became professor of history and political science at Bonn, and later on took a prominent part in the political affairs of Germany. At the outbreak of the Revolution, in 1848, he was appointed deputy of Prussia in the Germanic Diet, and was the principal member of the committee appointed to draft a new German constitution. He exerted his influence in the Frankfort Parliament in favor of an hereditary German empire, the dignity to inhere in the King of Prussia, but his views were not accepted, either by King Frederick William IV. or the majority of the Parliament. After a less conspicuous parliamentary activity at Erfurt and Berlin, Dahlmann returned to his academic duties, to which he devoted himself till his death, December 5, 1860. Besides the works mentioned above, he was the author of important histories of the English and French revolutions, of a work in two volumes on early Germanic history, and the editor of the *Ditmarsh Chronicle*. Consult: Springer, *F. C. Dahlmann* (Leipzig, 1870-72); Nasse, *F. C. Dahlmann*, an inaugural lecture (Kiel, 1885).

DAHLONEGA, däl'lo-nē'gá (from American Indian *Tauhunecca*, yellow gold). A town and the county-seat of Lumpkin County, Ga., 78 miles northeast of Atlanta (Map: Georgia, B 1). It is situated among the foothills of the southern portion of the Blue Ridge Mountains in a gold-mining region, and has gold-mills, concentrators, and an extensive chlorination plant. Until the Civil War, a United States branch mint was situated here. Dahlonega is the seat of the North Georgia Agricultural College, a department of the State University. The Cherokee Indians called the place Dah-lo-ne-ga, meaning yellow money. Settled in 1831, it was incorporated in the following year, and at the present time is governed by a mayor, elected biennially, and a city council. Population, in 1890, 896; in 1900, 1255.

DAHLSTJERNA, däl'shēr-ná, GUNNO EURELIUS (1661-1709). A Swedish poet, born at Öhr, September 7, 1661. He was an intense patriot, and beguiled the tedium of surveying expeditions in Sweden, Livonia, and Pomerania, by composing songs that are at times the best of his epoch, and again nearly the worst in their pathetic puerility. He had the misfortune to

choose bad models, the Silesian poets of the school of Lohenstein and the Italians of the school of Marini. But their florid pomposity could not always smother his true poetic fire, and his "Elegy on the Death of Charles XI." (1697) (*Kungaskald*) is sometimes sublime, while his "Goth's Battle Song" (1701) is an admirable popular ballad, an exulting defiance of the Russians, whose triumph at Poltava Dahlstjerna could not survive. He was a man of varied gifts, distinguished as a cartographer, and as the author of a number of scientific papers. He died in Pomerania, September 7, 1709.

DAHN, dän, FELIX (1834—). An historian, jurist, and novelist. He was born in Hamburg, February 9, 1834. His parents were celebrated actors, his early training classic. He studied history and law in Munich and Berlin, became privat-docent in Munich in 1857 and professor of law there in 1862. He has since occupied the same position in Würzburg (1863), Königsberg (1872), and Breslau since 1888. To history he has contributed *Die Könige der Germanen* (1861-97) and *Urgeschichte der germanischen und romanischen Völker* (1878 et seq.); to jurisprudence, *Die Vernunft im Recht* (1879); to poetry, collections of *Poems, Ballads, and Songs* (1857, 1873, 1875, 1878, 1892). He has also written many dramas, of which *Markgraf Rüdiger von Bechelaren* (1875) is typical. Dahn is most widely known, and deservedly, for his historical novels, which deal mainly with the primitive Germanic peoples, from the Vikings of Norway to the Goths of Italy, and from prehistoric times to the Crusades. Of these there are more than twenty, the chief of which are *Odhins Trost* (1880) and the longest and best of all, *Ein Kampf um Rom* (1876). This latter work has an epic breadth and an artistic unity that makes it one of the most striking historical novels of recent times. It is an epitome of the history of the German invasion of Italy, involving immense learning, borne so lightly by the author that it never oppresses the reader. The period is that of Justinian and Theodora, of the Gothic kings Theodoric, Totila, Vitiges, and Teja. Through the four volumes the interest never flags, and the dread of impending fate increases to the tragic close. Dahn's shorter stories of the migration, *Felicitas* (1883), *Bissula* (1884), *Fredigundis* (1885), *Attila* (1888), and *Stilicho* (1900), are also worthy of mention; but facility of composition has been Dahn's snare.

DAHOMÉY, dá-hō'mí or dá'hó'má'. Formerly a negro kingdom of West Africa, now a French colony, comprising with its dependencies all the French possessions in the region bounded by the military territories of French Sudan on the north (near latitude 14° N.), the British colonies of Nigeria and Lagos on the east, the Gulf of Guinea on the south, and the German colony of Togo on the west (Map: Africa, E 4). The total area is estimated at nearly 60,000 square miles, the territories of Kwala and Say having been added in 1899. There are 70 miles of coast. The surface is low and sandy along the Gulf, which is bordered by lagoons. The country is very hilly in the northern and more extended part, which includes the Mahé highlands. In the interior there are savannas, and large districts having a rather luxuriant flora; and

finally, the extreme north is characterized by bare tracts of desert, forming part of what is called Upper Dahomey. The only river of importance is the navigable Weme, which traverses the eastern part of the country. Mono, however, borders on the west, and the Niger on the north-east.

The climate is unhealthful in the low coast lands, being both hot and moist, but is favorable in the interior. The rainy season is in summer. A large part of Dahomey is covered with thick forests abounding in rubber-plants, and also palms which yield large quantities of oil and kernels for export. The soil is remarkably fertile, and along the coast manioc, maize, and potatoes are grown by the industrious natives, who also weave, and make pottery. Trade, which in former days was little more than an exchange of trinkets for gold and other equally precious articles, has now assumed an entirely modern aspect and importance. The commerce is mostly concentrated in the Gulf towns, especially in Porto Novo, the main port of the colony. The exports, consisting almost entirely of palm-oil and palm-kernels, amounted to nearly 13,000,000 francs in 1900. The imports for 1900 exceeded 15,200,000 francs, and were made up chiefly of liquors, cotton, and tobacco. About one-fourth of the trade is with France. In 1900 vessels with a total tonnage of 394,000 tons entered and cleared the ports. The port Kotonu is connected with the Niger and the Senegal by telegraph. There is regular steamship communication with Europe.

Dahomey was an absolute monarchy previous to the French occupation. There was a standing army estimated at over 15,000, consisting partly of female warriors or amazons, who were distinguished for superior physique and high skill in the use of weapons. At present the colony is locally administered by a French Governor, assisted by a council over which he presides. The council is made up of higher officials, and also two prominent residents, one of whom is native and one white. (See FRENCH WEST AFRICA.) The local budget for 1901 balanced at \$574,000. The colony is self-supporting. The population is estimated at nearly 1,000,000, composed of full-blooded Guinea Negroes, or Nigritions of the coast (Deniker). The Dahomans are tall, very long-headed (index 75.1), but not so black as the tribes of Senegal. In their own tongue, a dialect of the Ewe language, common on this part of the Slave Coast, they are called Fon or Fawin. Their religion is purely fetish, and the sacrifice of human beings, a widespread custom in former times, is still supposed to be practiced. In spite of a low standard of morality and warlike attributes and usages, the Dahomans are polite in their intercourse. The activity of missionaries has thus far been attended with little success, except in the case of the dervishes, who are indefatigable in their efforts to spread the gospel of Islam. The capital of the colony has been removed, since the French occupation, from Abomey to Porto Novo (q.v.). Other towns are Grand Popo, Agoué, Say (on the Niger), Whydah, and Allada, an important trading point.

The kingdom of Dahomey arose in the seventeenth century around the city of Abomey as a nucleus. By successive conquests the kings extended their rule to the highlands of the Mahé

on the north and to the Slave Coast on the south (1772). There they came into contact with the Europeans and succeeded in obtaining control of a large part of the slave trade, which was then carried on actively by the English, the French, and Portuguese. With the cessation of the slave traffic, the prosperity of the country came to an end. France secured a firm footing on the coast in the second half of the nineteenth century. Between 1878 and 1885 it obtained possession of Kotonu, Porto Novo, and Grand Popo, and after a bloody contest in 1890 forced King Behanzin to acknowledge its title to the coast region. War broke out again in 1892, and resulted in the taking of Abomey, the deposition of Behanzin (since retained as prisoner at Fort-de-France, Martinique), and the establishment of a virtual French protectorate. Since then the French have been actively engaged in extending their authority over the region to the north, so as to bring Dahomey into touch with their possessions in the Sudan. In 1897 and 1898 they concluded treaties with the Germans and the English, and the sphere of influence claimed by each was determined.

Consult: Skertchley, *Dahomey As It Is* (London, 1874); Careb, *Les territoires africains et les conventions anglaises* (Paris, 1901); Toutée, *Du Dahomé au Sahara* (Paris, 1899); Keane, in *Stanford's Africa* (London, 1895); Verdier, *Trente-cinq années de lutte aux colonies, côte occidentale d'Afrique* (Paris, 1897); Aublet, *La guerre au Dahomé* (Paris, 1894).

DAIBUTSU, di'boo'tsoo (Japanese, great Buddha). A famous Japanese image of Buddha at Kamakura, near Yokohama. It dates from 1252 and is a unique production of Japanese art, wrought of bronze and silver, with eyes of gold, and measures 50 feet in height and 97 feet in circumference. More ancient, even, dating from 749, and of more gigantic proportions, but of inferior artistic merit, is the Daibutsu at Nara, in the main island of Japan.

D'AIGUEBELLE, dag'bél'. See AIGUEBELLE.

DAILLÉ, dá'yá', or **DALLÉUS**, däl-lé'ús, JEAN (1594-1670). A French Reformed theologian, born at Châtellerault. He was tutor to the grandsons of Philippe de Mornay and traveled with them through Italy, Germany, Holland, and England in 1621-25. He became preacher at Saumur in 1625, and at Charenton in 1626, and was president of the last national synod of the Reformed Church held in France in 1659. He was one of the most learned and influential theologians of the Reformed Church in France, and wrote a considerable number of controversial works, among which the *Traité de l'emploi des Saints Pères* (1623) is of permanent value.

DAILY COURANT, THE. A journal called the first English daily newspaper, which first appeared March 11, 1702.

DAIMIÉL, di-myál'. A town in Spain, in the Province of Ciudad Real, 20 miles east-northeast of the city of that name, with which it is connected by rail (Map: Spain, D 3). It lies on the Azuer River, in the fertile Campo de Calatrava; it has several squares, and its principal streets, though unpaved, are wide and comparatively clean. Its chief buildings are the churches of San Pedro and Santa Maria—the former a Doric and the latter a Gothic structure

—a town hall, and a hospital. One of the most important towns in the La Mancha district, Daimiel has manufactures of woolens, linens, bricks, liquors, soap, hats, etc. Population, in 1900, 11,825.

DAIMIO, dī'mě-ō (Japan., great name). A term applied in Japan to a territorial feudal lord, in contrast with the *kuge* or landless noble of the Imperial Court. From the decay of the Mikado's power in the twelfth century, this class, numbering nearly 300, flourished until the abolition of feudalism in 1868, when they were amalgamated with the *kuge*, the two forming the Kuzoku, or flowery nobility. According to their former rank, wealth, power, historical or personal importance, the individual daimios have become princes, marquises, comits, barons, etc. Consult: Diekson, *Sketch of the History and Government of Japan* (London, 1869); and Griffis, *The Mikado's Empire* (New York, 1900).

DAINTY, LADY. A feminine type of fashion and frivolity in Cibber's *The Double Gallant*.

DAIRCELL. An Irish saint of the seventh century; the illegitimate son of a farmer at Luachair, near Castle Ireland, Kerry. He was born in the wilderness and would have been killed at birth by his mother, had not a dove descended from heaven to protect him, or "gather him to her in her wings;" whence his name *Dair-ecll*, meaning 'a gathering.'

DAIROLLES, dā'rōl', ADRIENNE. An actress of French origin, who, in England, in 1885, attracted notice as an amateur. The following year she supported Mrs. Langtry in a play called *Les Brebis de Pauvreté*. Later she appeared at the Drury Lane, Globe, and Adelphi theatres. In September, 1891, she was Noémie Nioche, in Henry James's play *The American*, produced at the Opéra Comique in London. In 1893 she appeared in New York at the Star Theatre. The following year she played at the Lyceum, and in the production of *The Fatal Card* at Palmer's Theatre, taking the part of Mercedes.

DAIRYING (ME. *deycry*, from *deyc*, dairy-maid, leel, *deigja*; probably connected with OSwed. *daggja*, to suckle, Skt. *duh*, to milk). That branch of agriculture which has to do with the production and utilization of milk. It embraces the feeding and management of milch cows, the supplying of cream and milk, and the making of butter and cheese, etc. The term *dairy husbandry* is applied to a system of farming under which cows are kept and bred, and the principal crops grown with special reference to the dairy herd. *Dairy* was formerly used to designate the place or house where the milk was kept, cheese was made, etc. Like almost all other occupations, dairying has become in recent years divided into several distinct and special lines. These differ as to the form of the product and the manner of disposing of it. In one case milk or cream may be produced for delivery to consumers direct from the dairy, or the same product may be delivered to a creamery to be manufactured into butter and cheese, or the product of the herd may be converted into butter and cheese at home.

In no branch of agriculture has greater progress been made in recent years than in dairying, and it is now regarded as among the most progressive and highly developed forms of farming

in the United States. While formerly believed to be confined by natural conditions to a limited area, known as the 'dairy belt,' it has been shown that the industry can be profitably and successfully carried on over a wide range of country, and that, generally speaking, good butter and cheese can be made by proper management in almost all parts of North America. Dairying was formerly confined to the spring and summer months, when pasturage could be had for the cows, and it was planned to have the cows calve as far as possible in the spring; they were generally allowed to go dry during the fall and early winter, and were neither well fed nor well housed through the winter. Winter dairying was practically unknown, as it was not supposed to be feasible or profitable. Under the system at present followed, dairying is not confined to any season, and the cows are fed succulent fodder during the winter in the form of corn silage, and roots, in addition to hay and liberal grain rations, composed largely of bran, cornmeal, and the by-products of factories where gneose and similar products are made. Great stress is laid upon the value of succulent foods as supplements to dry feed in winter, and in all countries where dairying has attained a high degree of development succulent feeds have occupied a prominent place in the ration given throughout the year. Corn silage is extensively relied upon for this purpose in the United States, being the cheapest food which can be supplied over a wide extent of the country. There may now be said to be two general systems of summer-feeding cows, the pasturage system, and the 'soiling' system, in which latter the green crops are cut for the animals. Pasturage is still extensively practiced where practicable, and it is quite customary to feed some grain to good cows on pasture. A large number of cows in the eastern part of the United States are now 'kept up' during summer, such green feed as comes into condition in succession throughout the season being raised for them. This method is thought to be more economical in sections where land commands a high price. A much larger number of cows can be kept on a given area by this 'soiling' system, and the animals are found to keep healthy and do well under it. Perhaps the most remarkable advance in dairying has been in the keeping of better cows, and in giving more attention to their feeding, comfort, and general management. The introduction of the creamery and cheese-factory systems (q.v.) has caused a great revolution in dairy practice, to a large extent transferring the manufacture of butter and cheese from the farm to the factory. The invention of the Babcock test, which has made practicable the payment for milk by test and placed it within the power of dairymen to test their individual cows, has been a very potent factor in improving the grade of cows which are kept, and has probably done more than any other single thing to advance American dairying. Milk of guaranteed fat-content is now sold in most of the large cities, and cream is supplied of various degrees of richness, according to the purposes for which it is intended. The sanitary conditions of milk production have been greatly improved as a result of bacteriological and other studies which have been made, and pasteurized milk and cream are now extensively used.

Dairying has been very greatly advanced by

the invention and introduction of various kinds of dairy machinery, such as creaming apparatus, notably the separator; hand and power churns, butter-workers, cheese vats and presses, etc. The cream separator, aside from its increased efficiency and reduction of labor, has almost eliminated the disturbing factor of climate from a large part of dairy management, and has altogether worked a revolution in this industry. See **BUTTER**.

The numerous by-products of the dairy are now very generally utilized in a variety of ways. The skim milk and buttermilk are, where practicable, fed to animals; considerable quantities are sold in towns and cities for household consumption, and milk-sugar is made from skim milk and whey. The casein of skim milk is also dried and prepared as a bakers' supply and substitute for eggs, as the basis of an enamel paint, as a substitute for glue in paper-sizing, and is also solidified and used for making buttons, combs, and many similar articles.

The value of the principal dairy products of the United States (milk, butter, and cheese) was estimated by the Federal Department of Agriculture for the year 1899 to be over \$450,000,000. "If to this be added the value of the skim milk, buttermilk, and whey, at their proper feeding value, and the value of the calves dropped yearly, the aggregate value of the product of the dairy cows exceeds \$500,000,000."

The leading dairy States are Iowa, New York, Pennsylvania, Illinois, Wisconsin, Ohio, Minnesota, Kansas, Michigan, and Indiana. In the Middle and Eastern States the milk is used quite largely to supply the numerous large towns and cities. In the Central West and Northwest butter is the principal dairy product. Dairying is also quite extensively practiced in Canada, where both butter and cheese of good quality are made. Canadian cheese, especially, enjoys an excellent reputation.

Since 1872 oleomargarine (q.v.), known in Great Britain as margarine and butterine, has been used in the United States, and has become a formidable competitor of the true dairy product. Its use in adulterating both butter and cheese led to the passage in several States of laws restricting its use and sale. The manufacture of oleomargarine cheese, or 'filled' cheese, as it is called, has greatly injured the good name of American cheese.

For further discussion of topics relating to dairying, see: **CATTLE**—*Dairy Cattle*; **BUTTER-MAKING**; **CHEESE-MAKING**; **MILK PRODUCTION**; **CHEESE-FACTORY**; **CREAMERY**.

DA'IS (Fr., canopy). This term was used with considerable latitude by mediæval writers. Its most usual significations are the following: (1) A canopy over an altar, shrine, font, throne, stall, chair, statue, or the like. The term was applied to the canopy without regard to the materials of which it was composed, which might be cloth, wood, stone, metal, or other substance. (2) The chief seat at the high table in a hall, with the canopy which covered it, from which probably the word in all its significations was introduced, its French meaning being a canopy. (3) The high table itself. (4) The raised portion of the floor, or *estrade*, on which the high table stood, and by which the upper was divided from the lower portion of the hall. (5) A cloth of state for covering a throne or table. In old

writings the word occasionally takes the form of *dois*, and more rarely that of *dez* or *detz*.

DAISY (AS. *dages cūge*, day's eye, referring to the form of the flower). A plant of the genus *Bellis*, of the natural order Compositæ. The common daisy (*Bellis perennis*), plentiful throughout Europe, flowers almost all the year in pastures, meadows, and grassy places. For illustration, see Plate of **DAILLIAS**, etc. What are called double varieties, with flowers of various and often brilliant colors, are very commonly cultivated in gardens. A variety has the flower (head of flower) surrounded by smaller ones, the short stems of which grow from the summit of the scape or leafless stem. The daisy (*gowan* of the Scotch) has long been a favorite with poets and lovers of nature, characteristic as it is of many of the fairest summer scenes, its blossoms gemming the pastures, and recommended also by its frequent appearance during the severer seasons of the year. Its flowers close at night. It is sparingly introduced in America. A species of *Bellis* is, however, found in the United States (*Bellis integrifolia*), but it is confined to Kentucky, Tennessee, Arkansas, and the Southwestern States. The flower commonly called daisy, or oxeye daisy, in the United States is a species of chrysanthemum (*Chrysanthemum leucanthemum*). A number of other plants are called daisies in the United States, among them *Rudbeckia hirta*, also called yellow daisy and black-eyed susan, *Erigeron annuus*, *Erigeron strigosus*, and other species are called daisies or daisy fleabane, and a number of species of wild aster are likewise known as daisies.

DAISY, SOLOMON. In Dickens's *Barnaby Rudge*, the rusty little parish clerk of Chigwell, and one of the 'quadrilateral,' or village club, which met at the 'Maypole.'

DAISY MILLER. A well-known novel by Henry James (1878), so called from the name of its heroine, an American girl who disregarded European rules of conduct. This character sketch was much criticised as not being a true representation of the American type; but its veracity is now admitted.

DAITYA, dit'yā (Skt., sons of *Diti*, a popular formation from *Aditi*, the boundless goddess). The Titans of Hindu mythology, hostile to the gods and disturbers of religious observances.

DAKAR, dā-kār'. A seaport in the French colony of Sénégal, Africa, situated about 1½ miles north of Gorée and on the extreme point of Cape Verde (Map: Africa, C 3). It has an excellent harbor and is connected by railway with Saint Louis, 163 miles distant. The climate is unhealthful. There are a number of large factories, and the commerce of the town has increased since the completion of the railway to Saint Louis. Population, in 1896, 12,000.

DA'KER HEN (dialectic Engl. and Scotch *daker*, to loiter; cf. OFlem. *duckeren*, to move to and fro). An English local name for a corn-crake. See **CRAKE**.

DAKO'TA. See **NORTH DAKOTA**; **SOUTH DAKOTA**.

DAKOTA (or JAMES) RIVER. A navigable stream rising in Wells County, N. D., about seventy miles northeast of Bismarck (Map: South Dakota, G 4). It flows southerly through a fertile country, and joins the Missouri

River nine miles east of Yankton, S. D. It is about 400 miles long in its general direction. It falls nearly 600 feet, but the fall is so uniform that the stream is incapable of much development as to water-power. Only small tributaries flow into it.

DAKOTA INDIANS. See **STOUX**.

DAKOTA STAGE. A subdivision of the Cretaceous system in America, the rocks of which were first described as occurring in Dakota. It comprises conglomerates, sandstones, and clays, with layers of lignite, and is found along the western edge of the great plains from Texas to Canada. In the Black Hills the series of rocks is from 250 feet to 400 feet thick. The coal deposits of Bear Creek, Wyo., are probably of this age. See **CRETACEOUS SYSTEM**.

DAKSHA, dāk'shā. A deity in Hindu mythology, represented as having a goat's head, and regarded as a son of Brahma (q.v.). His name means the *dexterous* or *clever* god, and in the oldest of the Vedas he is accounted especially as a progenitor of the race of the gods. His daughter Umā, according to later mythology, was married to Siva (q.v.). Owing to an affront received in connection with a great sacrificial feast, Siva slew Daksha and cut off his head. The scene is portrayed in Hindu sculpture. Siva later restored his father-in-law to life, and replaced his head, which had accidentally been destroyed, by the head of a goat, which the god still wears.

DALAGUETE, dāl'gā'tā. A town of Cebú, Philippines, 49 miles from Cebú. It is situated on the coast, near the mouth of the river of the same name. Dalaguete was founded in 1711. Population, in 1898, 21,323.

DALAI-LAMA, dā-lā'è lā'mā. See **LAMAISM**.

DAL'ARA'DIA. The ancient name applied to a district in Ireland, including the southern half of the present county of Antrim and the eastern part of the county of Down. The name is not to be confounded with Dalriada (q. v.), as Dalaradia, or 'Dal Araidh,' takes its name from 'Fiacha Ariad,' a king of Ulster of the Irian race, while Dalriada belonged to the race of Heremon. A Pictish colony from Scotland settled in Dalaradia a century before the beginning of the Christian Era.

DALAYRAC, dā'lā'rāk', NICOLAS (1753-1809). A French dramatic composer, born at Muret. His parents intended him to become a lawyer, and bitterly opposed his studying music; but in 1774 he was sent to Paris to enter the Guards of the Count d'Artois, and in that city he was able to pursue his musical studies. He was a pupil of Langle, and after writing a number of violin quartets, in 1781 produced his first opera, *Le petit souper*. Its success encouraged him, and he immediately began to write other works, producing in all about fifty operas. In 1798 he was made a member of the Stockholm Academy, and a little later a Chevalier of the Legion of Honor. His best operas were *Nina* (1786), *Azémia* (1787), *Camille* (1791), and *Romeo et Juliette* (1793), all of which show a vivid dramatic instinct and a charm of melody which made them immediately popular throughout France. He died in Paris, and his bust is now in the foyer of the Opéra Comique.

DALBERG, däl'bĕrk. The name of an ancient German family, the members of which possessed under the Holy Roman Empire the dignity of 'First Knight of the Empire.' The most distinguished member of the family was KARL THEODOR, Baron von Dalberg (1744-1817), Archbishop of Mainz, and famous as a patron of arts and letters. He assisted in the negotiations between Napoleon and Pius VII. at Paris in 1804, and was much esteemed both personally and as a scholar and ecclesiastical prince by such men as Wieland, Schiller, and Goethe. He was made Prince Primate of the Confederation of the Rhine (1806), and Grand Duke of Frankfort (1810), but was constrained by public opinion to retire into private life on the fall of Napoleon (1814). His writings are no longer of value. For his *Life*, consult: Krämer (Leipzig, 1821); and Beaulieu-Marconnay, *Karl von Dalberg und seine Zeit* (Weimar, 1879).

DALBERGIA, däl-bĕr'jā (Neo-Lat., named in honor of the Swedish botanist *Dalberg*). A genus of trees and climbing shrubs of the natural order Leguminosæ, having a stalked membranous pod, which is flat, tapers to both ends, and contains one to three flat seeds. The leaves are pinnate, with a terminal leaflet. All the species are natives of warm climates. Some of them are valuable timber-trees, particularly the sissou of Bengal (*Dalbergia sissou*), much prized, and more extensively used in the north of India than any other timber-tree except the sal (q. v.). The sissou extends through India to Afghanistan, growing at elevations up to 5000 feet. The trees become 60 feet high; the wood is elastic, seasons well, does not warp, and has a greater transverse strength than teak or sal. *Dalbergia latifolia* furnishes the East Indian rosewood, or Malabar blackwood, which attains a diameter of six feet. The wood is heavy, dark, and very strong, and is extensively used in cabinet-work, for ship-knees, gun-carriages, and agricultural implements. *Dalbergia nigra* and *Dalbergia miscolobium* of Brazil furnish valuable woods for export. *Dalbergia monetaria*, or *Ecastophyllum monetaria*, a related tree, a native of Surinam, yields a resin very similar to dragon's blood.

D'ALBERT, däl'bār', EUGEN FRANCIS CHARLES. See **ALBERT**.

DALE, DAVID (1739-1806). A Scottish manufacturer, born at Stewarton, Ayrshire. He secured the use of Arkwright's spinning patent, founded the New Lanark mills, and subsequently other important establishments, and became widely known for his many benevolences. Robert Owen married his daughter and succeeded him in the Lanark mills. Dale was the founder and chief pastor of a Scotch Church of Congregational principles, the members of which were called 'Dalites,' or 'Old Independents.'

DALE, JAMES WILKINSON (1812-81). An American Presbyterian divine. He was educated at the University of Pennsylvania, and at Andover and Princeton theological seminaries, and was pastor from 1845 to 1876, with his last charge at Wayne, Pa. He died at Media, Pa. He wrote the elaborate works on baptism: *Classical* (1867), *Judaic* (1869), *Johannic* (1871), and *Christic and Patristic Baptism* (1784). For his biography, consult James Roberts (Philadelphia, 1886).

DALE, RICHARD (1756-1826). An American naval officer. At the opening of the Revolutionary War, he entered the English service, but afterwards joined the American Navy, served under John Barry in the brig *Leaington*, and later as first lieutenant under Paul Jones, and gained distinction in the engagement between the *Bon Homme Richard* and the *Scraps*. He was several times taken prisoner. After the declaration of peace with England he was appointed captain, and in 1801 had command of the squadron sent against Tripoli. (See BARBARY POWERS, WARS WITH.) He resigned in 1802 and spent the rest of his life in retirement.

DALE, ROBERT WILLIAM (1829-95). An English Congregational minister and author. He was born in London, graduated at the University of London in 1853, and in the same year was ordained to the ministry. He was chairman of the Congregational Union in 1868 and 1869; edited *The Congregationalist* for seven years; and in 1877 visited the United States to give the Lyman Beecher lectures on preaching at the Yale Divinity School. He was the first Englishman to give this course. His pastorate was for many years in Birmingham, where, besides being a strong leader in the affairs of his own Church, he was influential in politics. Among his publications are: *The Jewish Temple and the Christian Church* (1863); *The Atouement* (1875); *Impressions of America* (1878); and *The Fellowship of Christ* (1891).

DALE, Sir THOMAS (? -1619). A colonial Governor of Virginia. He served for some time as an English officer in the Netherlands, and in 1606 was knighted by King James. In 1611 he was sent to Virginia, by the London Company, with supplies, and, in the absence of Lord de la Warr (q.v.), the Governor-General, assumed control of the Government. He was nominally relieved in August of this year, by Sir Thomas Gates, but nevertheless remained the leading spirit of the colony, holding the position of High-Marshal, and from 1614 to 1616 was again in full control. He returned to England in 1616; was put in command of a fleet sent out by the East India Company against the Dutch in 1618; defeated a Dutch fleet off the site of the present Batavia in November of this year; and in 1619 died at Masulipatam, India. His administration in Virginia was remarkable for its pitiless severity. Finding the colonists dejected, listless, and disinclined to work, he placed them under martial law, and inaugurated a code known as 'Dale's Code,' whose rigor has become proverbial. The years 1611-1616 were long known among the colonists as 'the five years of slavery.' Dale founded a new settlement at Henrico, overcame the Appomattox Indians, and by apportioning some of the lands among private individuals, took the first step toward abolishing the pernicious communal system. His administration of affairs was approved by the London Company, and Sir Edwin Sandys (q.v.), one of the most influential members, said in 1619 that "Dale . . . with great and constant severity reclaimed almost miraculously those idle and disordered people, and reduced them to labor and an honest fashion of life." Much information concerning Dale and his administration is given in Brown, *The Genesis of the United States* (Boston, 1890), and *The First Republic in America* (Boston, 1898). A

copy of 'Dale's Laws' may be found in Force, *Tracts and Other Papers Relating to the Colonies in America*, vol. iii. (Washington, 1836-46). Consult also Prince, "The First Criminal Code of Virginia," in the *Report of the American Historical Society* for 1899 (Washington, 1900).

DALECARLIA, dä'le-kär'li-ä, or **DALARNE**, dä'lär-ne. An old province of Sweden, now forming the Län of Kopparberg or Falun. The Dalecarlians are celebrated for the part they took under Gustavus Vasa in freeing their country from the yoke of Christian II. of Denmark.

D'ALEMBERT, dä'län'bär' (1717-83). The assumed name of Jean le Rond, a French mathematician, philosopher, and encyclopaedist. He was the natural son of Chevalier Destouches and Madame de Tencin, and was left as an infant on the steps of the Chapel of Saint Jean le Rond, from which he received his name. He was tenderly reared by a glazier's wife, his father contributing secretly to his support, and was educated by Jansenists at the Collège Mazarin, where he showed a brilliant promise in mathematics, physics, and astronomy, to which he reverted after essaying law and medicine. At twenty-two he published a scholarly *Mémoire sur le calcul intégral*, at twenty-four another, *Sur la réfraction des corps solides*. His *Traité de dynamique* (1743) marks an epoch in mechanical philosophy. This work is based on the theory known as D'Alembert's principle, discovered by him at the age of twenty-six, and expressed in the proposition: The impressed forces are equivalent to the effective force. His *Réflexions sur la cause générale des vents* (1744) contains the first conception of the calculus of partial differences. In 1749 he published the first analytical solution of the precession of the equinoxes. He was made a member of the Academy of Sciences in 1741, and in 1754 of the French Academy, whose perpetual secretary he became in 1772. As such he wrote a series of *Eloges* of members deceased between 1770 and 1772. In 1751 he undertook, with Diderot, the editing of the great French *Encyclopédie*, and, though he withdrew from the editorship in 1758, because of Government interference with the publication, he continued to contribute articles in science and philosophy. Very noteworthy is his preliminary discourse, or general introduction, to the work, in which he traces in broad outlines the evolution of human society, civilization, science, and art. An article of his on Geneva involved him in a celebrated dispute with Rousseau on the merits of Calvinism and the stage as teachers of morals. Meantime his scientific work had attracted the attention of Frederick II., who repeatedly offered him the presidency of the Berlin Academy. Catharine II. of Russia offered him (1762) 100,000 francs a year as tutor to her son. This he also declined. David Hume left him a legacy of £200, and on the recommendation of Pope Benedict XIV. he was admitted to membership in the Institute of Bologna (1755). But he continued to live simply, being by nature a plain, independent, bluff, benevolent, though sometimes rude man. He was a total abstainer from alcohol. His last years are closely associated with the name of Mlle. de l'Espinasse (q.v.), whom he learned to admire at the literary salon of Mme. du Deffand (q.v.). She nursed him during a serious illness in 1765, and they were never

after separated, though not a breath of scandal attached to their connection till her death (1776), a shock from which he never recovered. D'Alembert is fully as important for his personality as for his works. He gave learning an official status in French society and did a great service to letters, both by his example and by his *Essai sur les gens de lettres* (1753), in fostering the independence of his class from subserviency to social prominence and political power. This essay exposed thoroughly and finally the evils of patronage. His religious opinions, once the subject of eager controversy, are revealed as a tolerant theism in his correspondence with Voltaire, published in Bossange's partial edition of D'Alembert's *Works* (1821). Condorcet's *Eloge* of him before the French Academy (1784) gives a sympathetic yet judicious account of D'Alembert's life and writings. Consult Bertrand, *D'Alembert* (Paris, 1889).

DALGARNO, GEORGE (1626-87). A Scottish writer, who interested himself in the subject of a universal language and in the methods of teaching the deaf and dumb. He was born at Aberdeen, studied at Marischal College, and afterwards kept a school in Oxford for thirty years. His *Ars Signorum, Vulgo Character Universalis et Lingua Philosophica* (1661) is an ingenious attempt to represent and classify ideas by specific arbitrary characters irrespective of words. His *Didascalocophus, or the Deaf and Dumb Man's Tutor* (1680), has for its design "to bring the way of teaching the deaf man to read and write as near as possible to that of teaching young ones to speak and understand their mother-tongue."

DALGARNO, LORD. A villainous favorite of Prince Charles, in Scott's *Fortunes of Nigel*; the enemy of Nigel and the betrayer of Lady Hermione. He is finally murdered while attempting to flee the country.

DAL'GETTY, CAPTAIN DUGALD. A mercenary soldier and ex-divinity student in Scott's *Legend of Montrose*; a brave and reliable fellow, whose prototype is a certain Munro who served among the Scotch and English auxiliaries in Swinemünde, in 1630.

DALHOUSIE, dāl-hōō'zī or dāl-hou'zī. A popular summer resort and port of entry, the capital of Restigouche County, New Brunswick, Canada (Map: New Brunswick, C 1). It is situated at the mouth of the Restigouche estuary on Chaleurs Bay, and has a large and well-protected harbor. A considerable trade in preserved lobsters and salmon, and in lumber, is carried on. Angling, boating, bathing, and beautiful hill scenery are among its varied attractions. Estimated population, in 1901, 3000.

DALHOUSIE, JAMES ANDREW BROWN RAMSAY, tenth Earl and first Marquis of (1812-60). A Governor-General of India. The third son of the ninth Earl, he was born at Dalhousie Castle, Midlothian, April 22, 1812. He was educated at Harrow, and graduated at Christ Church, Oxford. In 1837 he was elected Conservative member of Parliament for Haddingtonshire, and at the death of his father in 1838 became Earl of Dalhousie and took his seat in the House of Lords. In 1843 he was appointed Vice-President of the Board of Trade, and in 1845 succeeded Gladstone as President. His administration at the time of the so-called 'Railway Mania,' marked

his ability, and at the change of Ministry in 1846 Lord John Russell paid him a rare compliment in asking him to remain in office to complete his work. In 1847 he became the youngest Governor-General ever sent to India. His administration, through additions of territory, development of resources by railways, canals, and other public improvements, forms an important era in Indian history, although, on account of his reduction of the army of occupation, the Indian Mutiny was subsequently laid to his charge. He was the recipient of many honors, and in 1849 was created Marquis of Dalhousie. In 1856 he returned to England as an invalid, and died after a lingering illness, December 19, 1860. Consult: Arnold, *History of the Marquis of Dalhousie's Administration of British India* (London, 1862-65); the Duke of Argyll, *India Under Dalhousie and Canning* (London, 1865); and Trotter, *Life of Dalhousie*, in the "Statesmen Series" (London, 1889).

DALIN, dāl'én, OLAF VON (1708-63). 'The Father of modern Swedish poetry,' whose literary maturity is known in Sweden as the 'age of Dalin,' a period of transition from the dominance of German to that of French, and especially English literary ideals. He was born in the Province of Halland, August 29, 1708, the son of a clergyman. He studied at Lund, went to Stockholm as tutor, and entered the civil service in 1731. In 1733 he began to issue anonymously a literary weekly, *Svenska Argus*, that soon became widely popular for its piquant wit. Dalin announced his editorship, published *Thoughts About Criticism*; a comedy, *The Jealous Man* (1738); a tragedy, *Brunhild* (1739); and the witty *Story of the Horse* (1739), through which runs a satire on the history of Sweden, following it by another satire on contemporary politics, *April Work of Our Glorious Time*. Dalin's highest poetic flight is *Swedish Freedom* (1742), a didactic allegory. In 1751 he was made tutor of the Crown Prince (later King Gustavus III.), and commissioned by Queen Louise Ulrika, sister of Frederick the Great, to write a *History of Sweden* (4 vols., 1747-62). She also consulted him in establishing the Academy of Arts and Sciences (1753). In this year he was made Privy Councillor, but fell under suspicion of political intrigue and was banished from the Court, to which he returned in 1761, two years before his death at Drottningholm, August 12, 1763. Dalin's collected *Works* (1767) have no lasting qualities, but his personal influence was path-breaking and transforming in the national literature.

DALKEITH, dāl-kēth'. A market-town of Scotland, six miles southeast of Edinburgh (Map: Scotland, E 4). It has a corn-market, a large and commodious market-hall, erected in 1854; manufactures of carpets, besides iron-foundries, tanneries, and coal-works. There are large coal-mines near by. Dalkeith arose around an ancient castle, which was long a stronghold. It was successively held by the Grahams, the Douglasses, the Earls of Morton, and the Earls of Buccleuch. Dalkeith Palace, the chief seat of the Duke of Buccleuch and Queensberry, built about 1700 on the site of the old castle, is a large square structure overhanging the North Esk, amid fine grounds in which the two Esks unite. Population (police burgh), in 1901, 6753.

DALL, CAROLINE HEALY (1822—). An American author and philanthropist, born in Boston. She lectured frequently on theological subjects, and on questions associated with the amelioration of conditions affecting woman, and was a founder of the Social Science Association, the constitution of which she framed. For many years she conducted a class in literature and morals at her home in Washington. With Mrs. Pauline Wright Davis she founded *Una*, a journal devoted to woman's rights, and the pioneer publication of its kind in Boston. The writings of Mrs. Dall are devoted chiefly to a discussion of the rights of woman, and her work entitled *The College, the Market, and the Court, or Woman's Relation to Education, Employment, and Citizenship* (1867), is a widely known contribution to that subject. Another popular work from her pen is entitled, *What We Really Know About Shakespeare* (1885; 2d ed. 1886).

DALL, WILLIAM HEALY (1845—). An American naturalist, born in Boston. He was a special student under Louis Agassiz. In 1865-68 he accompanied the International Telegraph Expedition to Alaska, and from 1871 to 1884 he was on the United States Coast Survey of Alaska. Since 1880 he has been attached to the United States National Museum, and since 1893 he has been professor of invertebrate paleontology at the Wagner Institute of Science, Philadelphia. He is the author of numerous papers on mollusks, brachiopods, and the natural history of Alaska. Important among his works are: *Alaska and Its Resources* (1870); *Reports of the Mollusca of the Blake Expedition* (1880-90); *Mollusca of the Southwestern Coast of the United States* (1890).

DALLAS. A town and the county-seat of Paulding County, Ga., about 35 miles west by north of Atlanta; on the Southern Railway. New Hope Church, four miles from Dallas, was the scene of a sharp conflict (May 25-28, 1864) between the armies of General Sherman and General Johnston. Population, in 1890, 455; in 1900, 644.

DALLAS. A city and the county-seat of Polk County, Ore., 63 miles southwest of Portland; on La Creole Creek and on the Southern Pacific Railroad (Map: Oregon, B 5). It is situated in the fertile Willamette Valley, and has considerable trade, and manufactures flour, woolen goods, lumber, sashes and doors, organs, foundry products, and tanned leather, the industrial interests being promoted by good water-power. Sandstone is quarried in the vicinity. Dallas was settled in 1849, and in 1891 was chartered as a city. Population, in 1890, 848; in 1900, 1271.

DALLAS. A city and the county-seat of Dallas County, Tex., 33 miles east of Fort Worth, on Trinity River, and on the Gulf, Colorado and Santa Fé, the Missouri, Kansas and Texas, the Texas and Pacific, the Houston and Texas Central, and the Texas and New Orleans railroads (Map: Texas, F 3). It is in the great grain belt of the State, and has large manufacturing and commercial interests. The industrial establishments include many factories of cotton-gin machinery, saddlery and harness, cotton and woolen mills, grain-elevators, flour-mills, meat-packing plant, lumber and planing mills, cotton-compresses, cottonseed-oil mills, nurseries, etc.

Dallas is one of the largest distributing centres of farming implements and machinery in the United States. The city contains the Roman Catholic Pro-Cathedral of the Sacred Heart, the Protestant Episcopal Cathedral of Saint Matthew, Saint Paul's Sanitarium, with accommodations for 200 patients, a city hospital, Carnegie Public Library, a court-house, erected at a cost of \$300,000, a Confederate monument, and numerous public and private educational institutions. Dallas has a number of public parks, City Park and Oak Cliff being of notable beauty. The State Fair and Dallas Exposition is an annual event of more than State-wide reputation. The city is governed by a mayor, elected every two years, and a city council, in which rest the appointments of auditor, city engineer, city secretary, secretary of water-works, and city electrician; all other important offices are filled by popular election. The city's annual income amounts to about \$750,000; expenditures to \$575,000, the main items being about \$40,000 each for the departments of police, fire, and water-works, and about \$90,000 for schools. Population, in 1890, 38,067; in 1900, 42,638.

DALLAS, ALEXANDER JAMES (1759-1817). An American politician. He was born in the island of Jamaica, was educated at Edinburgh and at Westminster, and in 1783 removed from Jamaica to Philadelphia. In 1785 he was admitted to the bar, and soon became prominent both as a lawyer and a politician. He was Secretary of the Treasury in President Madison's Cabinet from 1814 to 1816, and it was on his recommendation that in 1816 Congress passed an act to incorporate a new United States bank. From 1815 to 1816 he discharged the duties of the War as well as of the Treasury Department. He published *Reports of Cases Ruled and Adjudged by the Courts of the United States and of Pennsylvania Before and Since the Revolution* (4 vols., 1790-1807); *Address to the Society of Constitutional Republicans* (1805); and *Exposition of the Causes and Character of the War of 1812-15*.

DALLAS, GEORGE MIFFLIN (1792-1864). An American statesman and diplomat. He was born in Philadelphia, the son of Alexander J. Dallas; graduated at Princeton in 1810; and accompanied Mr. Gallatin in his special embassy to Saint Petersburg, as private secretary. On his return he practiced law and successively filled, for his native city, the offices of deputy attorney-general, mayor, and district attorney. From 1831 to 1833 he represented Pennsylvania in the United States Senate, and from 1833 to 1835 was Attorney-General of Pennsylvania. In 1837 he was appointed American Minister at Saint Petersburg, but was recalled at his own request in 1839. From 1845 to 1849 he was Vice-President of the United States, and as such cast the deciding vote for the tariff bill of 1846. From 1856 to 1861 he was Minister to the Court of Saint James, where he was called upon to deal with two matters of importance, the Central American question and the recall of the British Minister at Washington, Sir John Crampton, both of which threatened for a time to cause considerable friction between the British and the American governments.

DALLAS, ROBERT CHARLES (1754-1824). An English miscellaneous writer, and a friend of

Lord Byron. He was born at Kingston, Jamaica, where his father was a physician and owner of a valuable estate. He passed his life in Jamaica, the United States, England, and France. On his return from the East, Byron showed Dallas the MS. of *Childe Harold* (first two cantos), and was encouraged by Dallas to publish it. In gratitude for his many services, Byron gave him the sums received for this poem and the *Corsair*. Dallas's *Recollections of Lord Byron* appeared in 1824. Dallas also wrote novels, tales, and tragedies. He died November 20, 1824, at Sainte-Adresse, Normandy.

DALLES, dälz (Fr., slabs, flagstones). A term applied, in regions which have been under French influence, to rapids where the rocky river-bed wears in smooth slabs, and consequently especially to rapids produced by the narrowing of rivers between basaltic rocks. The best-known dalles are those in the Columbia, the Wisconsin, the Saint Louis, Minn., and the Saint Croix, Minn. The dalles of the Columbia are east of the Cascade Mountains, at Dalles City, Ore., where the fantastic shapes which these rocks assume, together with the swiftly moving waters, form a river scene of rare beauty.

DALLES, THE, or DALLES CITY. The county-seat of Wasco County, Ore., 88 miles east of Portland; on the Columbia River, at the head of navigation, and on the line of the Oregon Railroad and Navigation Company (Map: Oregon, D 4). It is the starting-point for the grandest scenery of the lower Columbia. The city carries on an extensive trade in wool, live stock, grain, and fruit; and its manufacturing establishments include flouring-mills, a wool-scouring plant, and minor industries. A Methodist mission, followed by a trading station and military post, was established here in 1838, and the settlement was incorporated in 1858. The government is administered by a mayor, elected biennially, and a municipal council. Population, in 1890, 3029; in 1900, 3542.

DALLES OF THE WISCONSIN. A famous gorge through which the Wisconsin River flows between Adams and Juneau counties, Wis. It is 7.5 miles long, ending near Kilbourn City, 21 miles above Portage. The average width of the river in the Dalles is 200 feet, but in places it narrows to about 60 feet. The walls of the gorge, about 100 feet high, are Potsdam sandstone, in which the stream has fashioned many fantastic forms. It is a favorite resort for sightseers.

DAL'LING AND BUL'WER, BARON. See BULWER, WILLIAM HENRY LYTTON.

DAL'LINGER, WILLIAM HENRY (1841—). An English scientist, born at Devonport. He entered the Wesleyan ministry in 1861, and for many years preached in Liverpool. But he also gave a great deal of his time to scientific investigation with the microscope, and this work he continued while acting as principal of Wesley College, Sheffield (1880-88), as well as later. In 1880 he was made a fellow of the Royal Society, and from 1883 to 1887 was president of the Royal Microscopical Society. He has also lectured at Cambridge and at Oxford, and has been senior lecturer to the Gilchrist Educational Trust. His published works include the following: *Minute Forms of Life* (1866); *The Origin*

of Life (1878); *The Creator and What We May Know of the Method of Creation* (1887); and a thorough revision of Carpenter's *The Microscope and Its Revelations* (1901).

DAL'ONGARO, däl-on'gä-rö. FRANCESCO (1808-73). An Italian poet, novelist, and patriot, born near Treviso. Abandoning the priesthood, for which he found himself unfitted, he started at Trieste a revolutionary journal, the *Favilla*; served under Garibaldi in 1849; and, after living for some years in exile in Paris and Brussels, returned to Florence to accept a chair of literature. Later he taught at Naples, where he closed a life full of sorrow and misfortune. He left a great variety of writings, including plays once quite popular. He is remembered chiefly, however, for his graceful and spirited poems, many of them in the Venetian dialect, and for having adopted the *stornello*, a particular form of folk-poem, as a medium for patriotic verse, his famous *Stornelli politici*.

DALMANITES, däl'mä-ni'tèz (named in honor of the geologist *Dalman*). A genus of fossil trilobites found in rocks of Ordovician to Devonian age, especially in those of the Silurian, in North America, Europe, Asia, and Australia. The carapace is depressed, with well-marked axis, is ovate in outline, tapering to the tail, and has eleven thoracic segments, with a large, often pointed, pygidium. The head-shield is broad, sometimes with an anterior point, and the genal angles are pointed. The eyes are large and usually well raised above the general surface, and are provided with numerous distinct facets. The glabella has a broad frontal lobe and three lateral lobes. Dalmanites has several related genera—*Acaste*, *Chasmops*, *Pterygometopus*, etc.—which differ in more or less conspicuous features, and which are all members of the family Phacopida, of which the type genus is *Phacops*. About 100 species are known in the genus Dalmanites, and of these the best known are *Dalmanites limulurus* of the North American Niagaran series, its representative *Dalmanites caudatus*, of the English Wenlock, and *Dalmanites socialis*, of the Bohemian Ordovician. See PHACOPS; and for bibliography and illustration see TRILOBITE.

DAL'MANUTHA (Lat., from Gk. Δαλμανουθά, Dalmanoutha). A place mentioned in Mark viii. 10, as the locality ("into the parts of Dalmanutha") whither Jesus retired after feeding the four thousand. It was somewhere near the coast of the Sea of Galilee, but has not yet been identified. In the parallel record in Matthew (xv. 39) the name of the place is Magdala.

DALMATIA, däl-mä'shî-ä. The most southern crownland of Austria, occupying a narrow strip of land along the Adriatic, and bounded by Croatia on the north and by Bosnia, Herzegovina, and Montenegro on the east (Map: Austria, E 5). Its area, including the adjacent islands, is 4940 square miles. The eastern part of Dalmatia belongs to the region of the Dinaric Alps, which form a wall on the side of Bosnia, while parallel to the coast rise the mountain chains of Castella, Mosor, and a few others. The coast is well indented and skirted by many islands. The scenery of the Dalmatian coast is famed for its picturesqueness. The Gulf of Cattaro is one of the finest harbors in Europe. The mountains are generally composed of lime-

stone and barren of vegetation. Dalmatia has no navigable rivers of importance. There are a number of lakes which dry up in the summer, and considerable tracts are covered with swamps and morasses. Dalmatia has almost a subtropical climate. The summer is exceedingly hot and dry, and snow is rare in winter. The average annual temperature varies between 58° and 62°.

Owing to the frequency of political upheavals in Dalmatia, agriculture has been in a backward state. About one-fifth of the total area is in farms, vineyards, and vegetable and fruit gardens. The geographical position of the region makes it well adapted to the cultivation of southern fruits. The vine and the olive grow profusely on the coast, and considerable quantities of wine are exported. The famous maraschino cordial comes from Dalmatia, where it is made from a cherry (*marasca*) peculiar to the country. Fishing is one of the chief occupations of Dalmatia, employing a considerable portion of the population. Cattle-raising and dairying are also carried on to some extent. The chief mineral products are lignite, asphalt, and salt, mined on a small scale. Owing to its extensive coast, Dalmatia is an important centre of the Austrian sea trade, and has a well-organized merchant marine. Ship-building is prominent among the industries. The most important ports are Zara, Ragusa, and Spalato. Cereals are imported; oil, fish, meat, and skins are exported. Dalmatia has only about 80 miles of railway lines.

Local affairs are under the control of the Diet, consisting of 43 members, of whom 10 are elected by citizens paying a direct annual tax of at least 100 florins, 8 by the towns, and 20 by the rural communities, and the remaining 5 consist of the Roman Catholic archbishop, the Greek Orthodox bishop, and three representatives of the chambers of commerce of Zara, Ragusa, and Spalato. To the Lower House of the Austrian Reichsrat Dalmatia sends 11 delegates, of whom two are elected by all the qualified voters. Administratively the crownland is divided into 13 counties. Elementary instruction is given in nearly 400 schools, with an attendance of nearly 40,000. The population in 1900 was 591,597, showing an increase of 12.2 per cent. for the decade. Over 83 per cent. of the people are Roman Catholics and 16 per cent. Greek Orthodox. The Dalmatians, who constitute five-sixths of the population, are tall and short-headed (height, 1.715 m.; index, 87). They are supposed to be fundamentally the modern representatives of the ancient Illyrians, subjected by Augustus and modified afterwards by Mæso-Goths, Avars, and Slavs. They are now classed with the Serbo-Croats. These Dalmatian Slavs, especially those in the interior, often figure under the name of Morlaks. Italian is largely spoken in the towns. Capital, Zara (q.v.).

In ancient times Dalmatia was inhabited by the warlike race of the Dalmatii, who for nearly one hundred and fifty years resisted successfully the encroachments of the Romans, but who were finally subdued in the time of Augustus. After the fall of the Western Empire, Dalmatia, which had formed the southern part of the Province of Illyricum, was occupied by the Goths, from whom it was taken by the Byzantines. Early in the seventh century the Croats and Serbs took possession of the region. About the beginning of the eleventh century King

Ladislas of Hungary incorporated a part of Dalmatia with Croatia, while the other part came into the possession of the Venetian Republic, the Doge of which had in 997 assumed the title of Duke of Dalmatia. In the south the little republic of Ragusa (q.v.) maintained an independent existence. By the Peace of Campo Formio (1797), Dalmatia, with Venice itself, became subject to Austrian rule; and when Austria, in 1805, retroceded it to Napoleon, it was annexed to the Kingdom of Italy. In 1809 it was constituted part of the dominion of the Illyrian Provinces. Since 1814 Dalmatia has formed part of the Austrian Empire. In 1816 it was made a kingdom. Political revolts have been frequent.

Consult: Jackson, *Dalmatia, the Quarnero and Istria, etc.* (London, 1893); *Die österreichisch-ungarische Monarchie in Wort und Bild*, vol. vii. (Vienna, 1892); Yriarte, *La Dalmazia* (Milan, 1878); Royle, *Dalmatia Illustrata* (London, 1900).

DALMATIA, DUKE OF. See SOULT.

DALMATIAN (däl-mā'shan) **DOG.** See COACH-DOG.

DALMAT'IC. In ecclesiastical art and in the usage of the Roman Catholic Church, the distinguishing vestment of a deacon. Its name recalls its origin from the ordinary costume of Dalmatia, which the Emperor Commodus was the first to wear publicly in Rome. Pope Sylvester, in the fourth century, ordered deacons to wear it in the church. It remained, however, for centuries a garb of men of high rank; and Christian kings and emperors have often been invested with it to symbolize the quasi-sacred character of their functions. As an ecclesiastical vestment it was originally white, with broad perpendicular stripes of purple; it now follows the color of the day, with the stripes represented in embroidery. It reaches to the knee and has wide sleeves.

DALNY, däl'nŭ. A Russian seaport in Manchuria, on the peninsula of Liao-tung, a short distance north of Port Arthur (Map: China, F 4). The spacious harbor, ice-free throughout the year, is of sufficient depth for the accommodation of large vessels. The harbor works are on a large scale, and the port is intended to become the centre of Russian trade on the Pacific, especially with Japan and China. Although founded as late as 1899, Dalny has a considerable and rapidly increasing population.

DALOU, dá'lō', JULES (1838-1902). A French sculptor, born in Paris, pupil of Carpeaux and of Duret. For several years he confined his art to objects of industrial art in bronze, before beginning to exhibit works on a larger scale in 1862. His statue of a "Woman Embroidering" (1870) was awarded a prize. Having held some administrative office in the Louvre under the Commune in 1871, he was obliged to take refuge in England, where his works met with great favor. Appointed professor in the South Kensington Museum about 1878, he returned to France after the amnesty of 1879, and speedily won distinction as one of the most gifted representatives of the naturalistic tendency in his branch of art. His style, while kindred to that of Carpeaux, is more refined and free from eccentricity. His masterpiece is the high relief in marble, "Mirabeau Delivering His Famous Address in the States-General, 1789," a composition of great dramatic power, which was placed in the

Chamber of Deputies. Among his other works deserving notice are: "Triumph of the Republic," in the Place de la Nation; the "Monument of Eugène Delacroix," in the Garden of the Luxembourg; and "Bacchus Consoling Ariadne" (1892). He also produced a considerable number of statues and busts of noted men of the time.

DAL'RIA'DA. The ancient name for the northern half of the county of Antrim in Ireland, now known as 'The Route.' The Dalriads are supposed to have descended from Carbry Riada (Riogh-flhada, i.e. of the long wrist), a son of a chief of the Scots in Ireland, who ruled not only in the district of Ireland, named after him, but, according to Beda, crossed to Scotland and settled in the lands of the Picts. In the beginning of the sixth century the Dalriads, led by Fergus, passed over to Argyllshire, where they settled themselves permanently, and formed the kingdom of 'Dalriada in Albany.' The Scottish colonists increased so much in power that they threw off the yoke of Ireland, and, about 637, attempted to subdue that island, but were defeated at Magh Rath, in County Down. The Dalriads nevertheless extended their kingdom in Scotland, and in 843 their king, Kenneth, became King of Albany, and thus united under one sceptre the Dalriads, or Scots, and the Picts. Later the Kingdom of Albany was known as Scotland.

DALRYMPLE, dāl-rīm'p'l, ALEXANDER (1737-1808). A British hydrographer; a younger brother of Sir David Dalrymple, Lord Hailes (q.v.). He was born at New Hailes, near Edinburgh, July 24, 1737. In 1752 he obtained an appointment in the East India Company's service; but he labored under the disadvantage of youth and imperfect education, until Lord Pigot, Governor of the Presidency, gave him lessons in writing. In 1758 he made a voyage of observation among the Eastern islands, and at Suha negotiated a commercial treaty with the Sultan, which he returned to consummate in 1762, but was unsuccessful. In 1765 he returned to Britain, and in 1775 was sent to Madras as a member of council, but was recalled in two years, apparently without good reason, for in 1779 he was appointed hydrographer to the East India Company, and shortly after received a pension. In 1795, when the British Admiralty resolved to establish a similar office, it was conferred on Dalrymple, who held it until his summary dismissal, occasioned by an excess of zeal, on May 28, 1808. Depression at the humiliation occasioned his death, three weeks afterwards, on June 19, 1808, at Marylebone, London. He wrote a vast number of letters, pamphlets, etc., containing plans for the promotion of British commerce in various parts of the world, political dissertations, accounts of geographical expeditions, etc., and his library, containing valuable geographical and scientific works, was acquired by the Admiralty.

DALRYMPLE, Sir DAVID, Lord Hailes (1726-92). A Scotch judge and antiquarian, born in Edinburgh, October 28, 1726. He was the grandson of Sir David Dalrymple, youngest son of Viscount Stair. Educated at Eton, in Edinburgh, and finally in Leyden, he returned to Scotland in 1746, and in 1748 was called to the Scottish bar. In 1766 he was appointed judge of the Court of Session, with the title of Lord

Hailes. Ten years after, he was made Justice Lord. He died November 29, 1792. He was a voluminous writer. His most important works are: *Annals of Scotland, from the Accession of Malcolm III., Surnamed Canmore, to the Accession of Robert I., 1776*; with continuation to the *Accession of the House of Stuart, 1779*; and *An Inquiry into the Secondary Causes which Mr. Gibbon Has Assigned to the Rapid Growth of Christianity, 1786*. He also wrote works on legal antiquities and ancient Church history; edited old Scotch poems, and published biographical sketches of notable Scotchmen. He was the esteemed friend and correspondent of Dr. Johnson. Consult "Memoirs of Lord Hailes," in late editions of the *Inquiry, etc.*

DALRYMPLE, Sir JAMES, first Viscount Stair (1619-95). A Scotch lawyer and statesman. The son of a small proprietor in Ayrshire, he was born at Drummurchie in May, 1619. Educated at Glasgow and Edinburgh Universities, at an early age he entered the army raised in Scotland to repel the religious innovations of Charles I., but returned to civil and literary pursuits, and in 1641 was appointed professor of philosophy at Glasgow. In 1648 he entered as an advocate at the Scotch bar, where he rapidly acquired distinction. In 1649 and in 1650 he was appointed secretary to the commissioners sent to Holland by the Scottish Parliament to treat with Charles II.; and in 1657 was induced to become one of the 'commissioners for the administration of justice' in Scotland under Cromwell's Government. Dalrymple was a Royalist, but resigned his seat in 1663 on his refusal to take the 'declaration' oath, which denied the right of the nation to take up arms against the King. His great talents, however, induced Charles II. to create him a baronet, and in 1671 to appoint him Lord President of the Court of Session. He was invariably the advocate of moderate measures. In 1681 he refused to take the new test oath, and resigned his appointments. The same year he published the *Institutions of the Law of Scotland*, which is still the grand text-book of the Scottish lawyer. After some time spent on his estate in Wigtonshire, Dalrymple went to Holland in 1682 to escape factious persecution. During 1684-87, while residing at Leyden, he published at Edinburgh his *Decisions*; and in 1686, at Leyden, a Latin work entitled *Physiologia Nova Experimentalis*. He accompanied the Prince of Orange on his expedition to England. William reappointed him Lord President of the Court of Session and created him Viscount Stair, Lord Glenluce and Stranraer in 1690. He died in Edinburgh, November 25, 1695. His daughter, Janet, who died in 1669, within a month of her marriage to Dunbar, Laird of Baldoon, is the original of Scott's *Bride of Lammermoor*. Consult: Mackey, *Memoirs of Sir James Dalrymple, First Viscount Stair* (Edinburgh, 1873); and Graham, *Annals and Correspondence of the Viscount and First and Second Earls of Stair* (Edinburgh, 1875).

DALRYMPLE, Sir JAMES (?-c.1714). The second son of Viscount Stair, and the author of *Collections Concerning Scottish History Preceding the Death of David I.* (1705).

DALRYMPLE, Sir JOHN, first Earl of Stair (1648-1707). A Scottish statesman. He was the

eldest son of the first Viscount, and was familiarly known as the Master of Stair. He held office under James II. and William III. While Secretary of State for Scotland he incurred great odium as the instigator of the 'massacre of Glencoe.' In 1703 he was created Earl of Stair.

DALRYMPLE, Sir JOHN, of Cranston (1726-1810). The grandson of Sir James Dalrymple, and author of *Memoirs of Great Britain and Ireland from the Dissolution of the Last Parliament of Charles II. until the Sea Battle Off La Hogue* (3 vols., 1771), which created a sensation at its appearance, owing to the revelations it contained, culled from authoritative State papers.

DALRYMPLE, Sir JOHN, second Earl of Stair (1673-1747). A Scottish general and diplomat. The second son of the first Earl and grandson of Viscount Stair, he was born in Edinburgh, July 20, 1673. When eight years old, he killed his elder brother by the accidental discharge of a pistol. Alienated from parental affection by this unhappy circumstance, he was prudence under the care of a clergyman, who, by prudence and kindness, developed the excellent qualities of the youth. He proceeded to Leyden University, where he won a reputation for scholarship, and, after completing his curriculum at Edinburgh, in 1701, accepted a commission as lieutenant-colonel of the Scottish Regiment of Foot-guards, and gained high distinction in Marlborough's campaigns. In 1711 he retired from the army, and when George I. succeeded to the throne, Dalrymple, who had become Earl of Stair by the death of his father in 1707, was made Lord of the Bed Chamber, Privy Councilor, and Commander-in-Chief of the Forces of Scotland. The following year he went as ambassador to France, and exhibited the highest ability in counteracting the schemes for the reinstatement of the Pretender. But, as he refused to flatter his countryman, Law, then high in favor with the regent Orleans, he was recalled. For twenty-two years he lived in retirement at Newliston, near Edinburgh, and devoted himself chiefly to scientific agriculture, in which he originated distinct advancements. He was the first to plant turnips and cabbages in the open fields. In 1742 he was sent as ambassador to Holland, and in the following year served under George II. at the battle of Dettingen. Later he was made Commander-in-Chief of the forces of Great Britain. He died in Edinburgh, May 9, 1747. His Countess, a beautiful and cultured woman, who survived him twelve years, is the heroine of Scott's novel *My Aunt Margery's Mirror*. Consult Graham, *Annals and Correspondence of the Viscount and First and Second Earls of Stair* (Edinburgh, 1875).

DALSGAARD, dǎls'gård, CHRISTEN (1824—). A Danish genre painter, born at Knabesholm, near Skive, Jutland. He studied at the Royal Academy and under Rørbye, was made professor of drawing at the Academy of Sorø in 1862, and became a member of the Copenhagen Academy in 1872. His impressive delineations of Danish peasant life, showing a keen sense of observation and imbued with deep feeling, have justly caused him to be esteemed one of the typical masters of Denmark. Especially noteworthy among them are: "Christmas Morning on a Farm" (1848), in the Museum at Aarhus;

"Jutland Peasants Going to Communion" (1859); "Seizure for Debt" (1860); "Fisherman and Daughter" (1854); "Mormons Visiting a Joiner's Home" (1856); "Going to Church After Confinement" (1861), the last three in the Gallery at Copenhagen.

DALTON, dǎl'ton. A city and county-seat of Whitfield County, Ga., 100 miles north by west of Atlanta, on the Southern, the Western and Atlantic, and other railroads (Map; Georgia, B 1). It is in a region possessing extensive deposits of iron, limestone, and manganese; exports cotton, grain, and fruits, and has agricultural-implement works, foundries, and machine-shops, cotton-mills, lumber-mills, etc. Settled and incorporated in 1848. Dalton is governed, under a charter of 1874, by a mayor chosen every two years, and a city council elected on a general ticket. During the latter part of 1863 and the spring of 1864, Dalton was the headquarters of the Confederate General Joseph E. Johnston, who commanded the army for the defense of Atlanta. Several minor battles were fought in this vicinity. Population, in 1890, 3040; in 1900, 4315.

DALTON, HERMANN (1833—). A German Protestant theologian. He was born at Offenbach-on-the-Main, August 20, 1833; studied at Marburg, Berlin, and Heidelberg; was pastor of the German Reformed congregation in Saint Petersburg (1858-88), and has since lived in Berlin. He is the author of *Geschichte der reformirten Kirche in Russland* (1865); *Johannes a Lasco* (1881; Eng. tr. 1886); *Verfassungsgeschichte der evangelisch-lutherischen Kirche in Russland* (1887); *Urkundenbuch der evangelisch-reformirten Kirche in Russland* (1888); *Zur Gewissensfreiheit in Russland* (1890); *Die russische Kirche* (1891); *Zur Geschichte der evangelischen Kirche in Russland* (1893-98); and several sketches of travel around the world.

DALTON, JOUN (1766-1844). A celebrated English chemist and natural philosopher, born at Eaglesfield, near Cockermouth, in Cumberland. He received his early education in the school of his native place, and, after 1781, in a boarding-school kept by a relative in Kendal. Here his love of mathematical and physical studies was first developed. He wrote several mathematical essays, and in 1788 commenced a journal of meteorological observations, which he continued throughout his whole life. In 1793 he was appointed teacher of mathematics and the physical sciences in the new college at Manchester, where he chiefly resided during the remainder of his life, though frequently employed, after 1804, in giving lectures on chemistry in several large towns. In the years 1808 to 1810 he published his *New System of Chemical Philosophy* (2 parts, London), to which he added a third part in 1827. In 1817 he was appointed president of the Literary and Philosophical Society at Manchester. He was also a member of the Royal Society, and of the Paris Academy, and in 1833 received a pension of £150, afterwards raised to £300. In the same year Dalton's friends and fellow-townsmen collected £2000, to raise a statue to his honor, which was executed by Chantrey, and placed at the entrance of the Royal Institution in Manchester. Dalton was also honored by the University of Oxford with the degree of D.C.L., and with that of LL.D. by

the University of Edinburgh. His chief physical researches were those on the constitution of mixed gases, on the force of steam, on the elasticity of vapors, and on the expansion of gases by heat. In chemistry he distinguished himself by his progressive development of the atomic theory (see CHEMISTRY), as also by his researches on the absorption of gases by water, on carbonic acid, carburetted hydrogen, etc. His papers are mostly contained in the *Memoirs of the Literary and Philosophical Society of Manchester*, the *Philosophical Transactions*, Nicholson's *Philosophical Journal*, and Thomson's *Annals of Philosophy*. Besides these, we have his *Meteorological Essays and Observations* (London, 1793; 2d ed. 1834). Profound, patient, and intuitive, Dalton had precisely the faculties requisite for a great scientific discoverer. His atomic theory has revolutionized the science of chemistry and has yielded a greater number of valuable results than, perhaps, any other idea ever introduced into physical science. In his habits, Dalton was simple: in his manners, grave and reserved, but kindly, and distinguished by his truthfulness and integrity of character. Consult Roseoe and Harden, *A New View of the Origin of Dalton's Atomic Theory* (New York, 1896).

DALTON, JOHN CALL (1825-89). An American physiologist and physician. He was born in Chelmsford, Mass., and graduated at Harvard in 1844, and at the Harvard Medical School in 1847. He was professor of physiology successively in the University of Buffalo, in the Vermont Medical College, and in the College of Physicians and Surgeons, and in 1883 succeeded Dr. Alonzo Clark as president of the last. During the Civil War he rendered important services as surgeon in the Federal Army. He contributed many articles on medical subjects to scientific journals, and, in addition, published a valuable *Treatise on Human Physiology* (New York, 1859); *A Treatise on Human Physiology for Schools, Families, and Colleges* (1868); *The Experimental Method of Medicine* (1882); *Doctrine of the Circulation* (1884); and *Topographical Anatomy of the Brain* (1885).

D'ALTON, JOHANN SAMUEL EDUARD. See ALTON.

DALTON-IN-FURNESS, dāl'ton-in-fūr'nēs. A market-town in Lancashire, England, on the peninsula of Furness, about 4 miles northeast of Barrow-in-Furness (Map: England, C 2). A canal about three miles long connects it with the Irish Sea. It has extensive iron-works. Population, in 1890, 13,300; in 1901, 13,030.

DALTON'S LAW. See GASES, GENERAL PROPERTIES OF.

DALY, dà'lé', CÉSAR DENIS (1811-94). A French architect and writer on architecture, born at Verdun, Meuse. His principal work as an architect is the restoration of the Cathedral of Saint Cecilia at Albi, for which designs were shown at the Exposition in 1855. But the work upon which his reputation rests is the monumental journal, *Revue générale de l'architecture et des travaux publics* (1840-90). The forty-five volumes contain a theoretical and practical library of architecture. Among his other publications are: *Les motifs historiques d'architecture et de sculpture d'ornement* (1874); *L'Architecture funéraire* (1873); *L'Architecture privée au XIXème siècle* (Paris, 1870-77); *Motifs divers*

de serrurerie (Paris, 1881-82); *Des hautes études d'architecture* (1889).

DALY, CHARLES PATRICK (1816-99). An American jurist, born in New York City. He was admitted to the bar in 1837, and was Chief Justice of the Court of Common Pleas in New York for twenty-seven years, until retired by the age limit in 1868. From its organization in 1864 until his death, Judge Daly was president of the American Geographical and Statistical Society. Besides his *Historical Sketch of the Judicial Tribunals of New York* (1855), and many legal papers of importance, he wrote: *When Was the Drama Introduced into America?* (1864); *First Settlement of Jews in North America* (1875); *What We Know of Maps and Map-Making Before Mercator* (1879); and *History of Physical Geography*.

DALY, JOHN AUGUSTIN (1838-99). An American playwright and theatrical manager. He was born at Plymouth, N. C., and educated at Norfolk, Va., and in the public schools of New York City. He was dramatic critic for the *Sunday Courier* in 1859, and held similar positions on the *Express*, *Citizen*, *Sun*, and *Times* for some years. Meanwhile he was producing adaptations of several plays, and in 1867 his first original success, *Under the Gaslight*, was brought out at the New York Theatre. In 1869 he opened in Twenty-Fourth Street the playhouse known as the Fifth Avenue Theatre, which with such 'stars' as Fanny Davenport, Mrs. Scott Siddons, E. L. Davenport, and Clara Morris, quickly became very popular. After the destruction of this theatre by fire and an interval of a few months in another, he opened, in 1874, Daly's Fifth Avenue Theatre, which he managed till 1877. In 1879 he returned, after a year of study in Europe, and opened the house since known as Daly's Theatre on Broadway, near Thirtieth Street, which he controlled until the time of his sudden death in Paris. Mr. Daly had in his company at various times many of the best-known players in America. For years Miss Ada Rehan was his leading actress. Several times he went with his whole company to California, to England, and to Germany and France. In 1893 he leased a theatre in London. He wrote many adaptations from German and French plays, one of his earliest efforts being from Mosenthal's *Deborah*, in 1862. In the long list of works which he wrote or adapted are: *Divorce*, *Pique*, *Under the Gaslight*, *The Railroad of Love*, *Seven-Twenty-Eight*, *The Great Unknown*, *Love on Crutches*, and *The Last Word* (1890). Mr. Daly was especially noted for excellence in scenic presentation, and his Shakespearean revivals have received warm praise both in this country and in England. In 1894 he was presented with the Lætare Medal of the University of Notre Dame, Ind. He was a great book-lover, and made a remarkable collection of plates on biblical subjects, Thackeray, etc., which was sold at auction in the settlement of his estate. Besides his plays and dramatic adaptations, he was the author of *Woffington: A Tribute to the Actress and the Woman* (1888), and various minor articles.

DALY, JOSEPH FRANCIS (1840—). An American jurist, born at Plymouth, N. C. He studied law in New York City in 1855-62, was admitted to the bar in 1865, and from 1870 to 1890 was

a judge of the Court of Common Pleas of New York, of which he in the latter year became Chief Justice. In 1896-98 he was a justice of the State Supreme Court. During his career on the bench he was conspicuous for wide legal attainments.

DALYELL', or **DALZELL'**, THOMAS (c.1599-1685). A Scotch general, vigorous in the persecution of the Covenanters. He was born at Binns, Linlithgowshire. In 1642 he accompanied Gen. Robert Monro in the expedition to Ireland, and fought in 1651 at Worcester. Especially excluded by Cromwell from the Act of Grace, he took service under the Czar Alexis of Russia, and participated as a general in a number of wars against the Turks and Tatars. In 1666 he was appointed by Charles II. Commander-in-Chief of the forces in Scotland, and was particularly commissioned to repress the Covenanters—a commission executed with brutal vigor. His defeat of the Covenanted troops at Rullion Green was followed by cruelties which made his name a by-word through the countryside. A stubborn Royalist, he did not, says Creighton, "shave his beard since the murder of King Charles I."

DAM, TINKER'S. A guard of dough or clay placed by a tinker around a cavity to confine the melted metal until it 'sets.' It is worthless after use; hence the vernacular expression, 'not worth a tinker's dam.'

DAMA, dā'mā (Lat.). A gazelle (*Gazella dama*) of the Sudan, with short lyrate horns and no dark band on the sides. See **GAZELLE**.

DAMAGES (OF. *damage*, *domage*. Fr. *domage*, from Lat. *damnum*, loss). The pecuniary recompense given by a court of law to one who has suffered an invasion of a legal right through the act of another. The right invaded may be one which the plaintiff enjoys in common with other members of society, as, for example, his right to have his person or property not interfered with; or his right not to be injured through the negligence of others; or it may be a right which he has acquired through entering into a special legal relation with another, as by contract.

But, although the law furnishes a legal remedy for every violation of a legal right, that remedy is not always an action for damages. The entire jurisdiction of the equity tribunals is concerned with remedies of a different order—as injunction, the specific enforcement of contracts, etc.—the remedy of damages being for the most part left to the courts of common law. Furthermore, not even at common law does every invasion of a legal right give rise to an action for damages. The breach of a condition, for example, is remediable only by action on the part of the one injured, thereby restoring both parties to their former condition. Thus if the condition was attached to a sale of land or goods, its breach enables the injured party to rescind the transaction and place himself *in statu quo*, but not to sue for damages, however great the injury to him may have been.

Strictly speaking, the term damages is not applicable to all cases of a recovery of money for infringement of legal rights, but only to such as call for an estimate or admeasurement by the court or jury of the injury suffered and of the proper compensation to be made therefor. Where the 'damages' are liquidated, i.e. where the amount to be recovered is fixed in advance

by agreement of the parties, they are not damages, in the technical sense of the term. Thus an action to recover the amount payable on a bond, or the amount due for goods sold and delivered, or to recover a sum of money paid to the defendant by mistake, is not an action for damages, but an action to recover a debt. But where the amount claimed is not ascertained, as where an injury has been done to a man's character or property, or in the ordinary case of breach of contract, the action will be to recover the damages suffered through the defendant's wrongful act or default. The complaint or declaration of the plaintiff sets forth an estimate of the damages sustained by him, the amount of which will then be conclusively ascertained by the court or jury (usually the latter) upon principles determined by law.

The principles upon which damages are measured by the courts vary according to the nature of the right infringed and sometimes of the act by which it was violated, and are of a most illogical and unsatisfactory character. To a considerable extent they are still influenced by considerations which belong rather to the conditions and feelings of primitive society than to those which now govern the relations of the parties and the administration of justice. In their origin, damages were a pecuniary commutation of the right of private vengeance, and were based not on any principle of restitution, but on that of satisfaction to the injured party. It was a long step toward the orderly administration of justice when the victim of a theft was compelled to rest satisfied with four times the value of the thing taken, instead of scourging the thief and selling him into slavery, as was the law of the Twelve Tables. But the damages so awarded were as clearly vindictive in character as was the harsher penalty of the earlier law, and this vindictive element still survives in the modern law of damages. Thus, it is still the law in England and in many of the United States that a tenant who commits willful waste on the premises shall pay thrice the amount of the damage committed, and that a tenant who refuses to quit after due notice shall thereafter pay his landlord double rent. To the same principle is due the doctrine of aggravation of damages, or 'vindictive,' 'retributory,' or 'exemplary' damages, which permits a recovery in excess of the actual damage suffered in certain cases of breach of promise of marriage, libel, slander, and seduction. There was abundant justification for furnishing this solace to the vindictive feelings of the injured party in an age when it was necessary to buy him off from a more violent vindication of them, but it is submitted that the survival of this barbarous principle into our milder age cannot be justified.

Obviously, the sound principle for the award of damages is that of restitution, rather than of satisfaction—the restoring to the injured party of the property of which he has been deprived, or making to him due compensation for the injury sustained by him—and this principle is generally followed by our law in most actions other than those above referred to. It is expressed in the phrase that damages are limited to the loss which the plaintiff has actually sustained. In practice, however, a more restricted rule is followed, the defendant being liable only for such damages as he did in fact contemplate or which

are the natural and probable consequences of his acts, whether contemplated by him or not. This rule is equally applicable in cases of contract and of tort, and operates to exclude what are called 'remote' or merely 'consequential' damages. That, under a perfect system, the latter would also be included in an award of damages can hardly be doubted, but the judicial distrust of the jury, by whom, both in England and America, the award is usually made, has induced the courts to adopt the narrower rule.

Damages are also an available remedy in some cases of injury, even where no actual loss has been sustained. It is the violation of a legal right, and not the detriment or loss resulting therefrom, which furnishes the ground for an action for damages. Such an action, accordingly, is the appropriate remedy in the case of a trespass upon land, an unauthorized interference with a watercourse, and the like, although no injury or serious inconvenience to the tenant or riparian proprietor results. The damages to which the plaintiff is entitled in such a case are not 'substantial,' but 'nominal.' And, on the other hand, where loss or harm is sustained, but without the violation of a legal right, the damage is irremediable by any legal process. It is *dammum absque injuria*.

For the measure of damages appropriate to the various classes of rights, see the articles in which those rights and the remedies for their infringement are considered. See especially CONTRACT; TORT; INJURY. Consult: Holmes, *The Common Law* (Boston, 1881); *Essays on Anglo-Saxon Law* (Boston, 1876); Lee, *Historical Jurisprudence* (New York, 1900); Arthur G. Sedgwick, *Elements of Damages* (Boston, 1896); Sedgwick, *Treatise on the Measure of Damages* (8th ed., New York, 1891); Sutherland, *Treatise on the Law of Damages* (Chicago, 1893); Mayne, *Treatise on the Law of Damages* (5th ed., London, 1894); Watson, *Treatise on the Law of Damages for Personal Injuries* (Charlottesville, 1901); Harris, *Treatise on Damages by Corporations* (Rochester, 1894).

DAMAN, dá-mán', or **DAMÃO**, dá'mouh. A fortified seaport and district on the west coast of India, belonging to the Portuguese since 1558. The town stands at the mouth of the Damán River about 100 miles north of Bombay (Map: India, B 4). The harbor affords good shelter from the southwest monsoon. The neighborhood is well stocked with suitable timber for the building and repairing of ships, which largely employ the inhabitants. Damán also has important deep-sea fisheries and salt-works. There is a scarcity of fresh water. The district is an administrative dependency of Goa. Area of district, 168 square miles. Population, in 1887, 77,454.

DAMAN, dá'mán (Syrian). An old name for the Syrian hyrax (*Procapra syriaca*), the 'coney' of Scripture (Prov. xxx. 24-28, etc.), also called rock-rabbit. See HYRAX, and compare DASSIE.

DAMANHUR, dá'mán-hoor' (Egypt. *Tema-en-Hor*, city of Horus, Lat. *Hermopolis Minor*). A town of Lower Egypt, capital of the Province of Beherah (Map: Egypt, D 2). It is situated on the Mahmudieh Canal and the railway line leading from Cairo to Alexandria. It has a considerable commerce in cotton and woolen goods. Population, in 1897, 27,236.

DAMAR or **DHAMAR**, dá-mär'. A town of Yemen, Arabia, situated about 63 miles south of Sana, on the route to Mecca (Map: Arabia, with Turkey in Asia, Q 12). It carries on some trade in horses. Population, about 20,000.

DAMARALAND, dá-má'rá-lánd. See GERMAN SOUTHWEST AFRICA.

DAMASCENUS, NICOLAÛS. A Greek historian. He lived in the time of Augustus and Herod the Great, at whose court he spent the greater part of his life. His principal work was a universal history in 144 books, of which only fragments remain. He also wrote an autobiography and a history of the education of the Emperor. Fragments of these works, as of the first seven books of his universal history, are preserved in the collections of Constantinus Porphyrogenitus. Nicolaüs was, in philosophy, an adherent of the Peripatetic School, and wrote a compendium of Aristotelianism. Historical fragments are edited by Müller, *Fragmenta Historicorum Græcorum*, vol. iii. (Paris, 1868-83).

DAMASCIUS (Lat., from Gk. *Δαμάσκιος*, *Damaskios*). A Neoplatonic philosopher of the sixth century A.D. He was born at Damascus, and was the last teacher of Neoplatonism at Athens. When the philosophic schools were closed by imperial edict in 529, he, with Simplicius, Diogenes, Priscian, and others, was forced to go to Persia. Of his writings we possess his book *On the Origins*, edited by Kopp (Frankfort, 1826), a commentary to Aristotle, and an extract from his life of Isidorus of Gaza, preserved by Photius, 181 and 242.

DAMASCUS (Arab. *Dimishk-esh-Shâm*). The capital and largest city of Syria, Asiatic Turkey (Map: Turkey in Asia, G 6). It is situated in a plain at the eastern base of the Anti-Libanus, 53 miles southeast of Beirut. The city with its beautiful surroundings and its abundant supply of water has since the earliest times been regarded by the Arabs as the most beautiful spot in the world, and is supposed to have served as a model for the paradise described in the Koran. The appearance of Damascus from a distance is impressive, but upon a closer inspection it is, like most Oriental cities, disappointing. It is about five miles in circumference and is surrounded by partly ruined walls, pierced by seven gates. The streets, with the exception of the 'Straight Street,' on which Saint Paul is supposed to have lived, are crooked and narrow. The houses are generally built in the Moorish style and not infrequently combine a splendidly decorated interior with a plain and sombre exterior. The walls fronting the street are usually without windows; the courts in the houses of the wealthy residents are adorned with splendid marble fountains, fine trees, and flowers. Damascus derives its water-supply, by an excellent system of canals, conduits, and pipes, from the Barada, the Abana of the Old Testament, which traverses the city from west to east and divides the newer portion of the city on the north from the ancient walled city with its sectarian quarters on the south.

Of the seventy-one large mosques of Damascus that of the Omniads is the most important. It is supposed to have been originally a heathen temple converted into a Christian church at the end of the fourth century. It then contained what was believed to be the head of John

the Baptist, and was named the Church of Saint John. The site of the church was later acquired by the sixth Omniad Caliph, who erected on it a mosque of fabulous splendor, according to the description of the Arabic writers. After the conquest of Damascus by Timur the mosque was despoiled. It covers a site of $143 \times 41\frac{1}{2}$ yards, and has the shape of a basilica divided by columns 23 feet high, ornamented, as also are the walls, with inscriptions from the Koran. The architecture belongs to different periods; only a small portion of the original structure has survived. The dome, 120 feet high, is flanked by three minarets, one 250 feet high. Other noteworthy mosques are the Sināniyeh with its striking green-tiled minaret, and the Tekkiyeh, with its graceful minarets and dome, founded in 1516 on the river bank to the west of the city as a refuge for indigent pilgrims. There are also numerous beautifully ornamented chapels. The Chapel of Abraham in the northern suburb of Burzeh, the leper hospital in the house of Naaman, the house of Ananias, the place of Saint Paul's conversion near the east gate, and the point where he was lowered from the walls are traditionally sanctified localities. The English cemetery on the southeast contains the grave of Buckle the historian, who died here in 1862.

Damascus was once a famous seat of learning, and contained numerous schools in which grammar, theology, and jurisprudence were taught. The higher schools, with a few exceptions, are now closed, and Damascus as a centre of culture has been surpassed by Cairo. Elementary education is provided to some extent by the missionary schools, and a number of higher schools are conducted by the French orders.

The municipal affairs are administered by a council in which Christians as well as Jewish residents are represented. Damascus is the seat of the Wali or Governor of Syria, and of the commander of the Syrian troops. The chief manufactures consist of silver and gold articles, stuffs interwoven with silver and gold threads, and inlaid furniture. The manufacture of the blades for which Damascus was famous has ceased. The commercial importance of the city rests chiefly on the transit trade, which, however, has considerably declined since the construction of the Suez Canal. The bazaars of Damascus are numerous and well kept, but they are generally poorly stocked, and the magnificent *khans* formerly thronged by merchants are now but indifferently attended. The exports consist chiefly of wool, hemp, grain, and animal products, grapes, and dried fruit. Damascus is connected by rail with its port, Beirut, and a railway line extends southward to El Muzerib, in the Hauram. It is visited monthly by caravans from Aleppo. The population is estimated at 154,000, and is very heterogeneous in its composition. About three-quarters is Mohammedan, while the rest consists of Christians belonging to different churches. The Jews number about 8000. The United States is represented by a consular agent.

The foundation of Damascus is attributed by Josephus to Uz, the son of Aram. The city was the seat of a kingdom at the time of the Hebrew monarchy. Subjugated by David, it soon regained its independence and even recovered sufficiently to attack the Kingdom of Israel, weakened by internal strife. In the second half of the eighth century B.C. Damascus

was conquered by Assyria and its people carried away to the land of the conquerors and replaced by colonies from Assyria. After the death of Alexander the Great, Damascus became part of the Kingdom of the Seleucide. Conquered by Pompey in B.C. 64, it became a dependency of Rome, under which it enjoyed local autonomy and regained a part of its former prosperity. It was during this period that Christianity was introduced into Damascus, and the city became the seat of a bishopric. In 635 it was taken by the Mohammedans, under whose rule it was for a time (previous to the founding of Bagdad) the residence of the Caliphs and was greatly adorned and fortified. After an unsuccessful siege by the Crusaders under Baldwin in 1148, Damascus was taken by Nureddin in 1154, and, at the death of the latter, passed into the hands of Saladin, who died there in 1193. The victory of Tamerlane over the Egyptians at Damascus in 1401 placed the city in the hands of the Mongol conqueror, who after exacting a large tribute from its residents slaughtered most of them and pillaged and burned the city. It was soon rebuilt, and in 1516 wrested from Egypt by the Turks under Selim I. Retaken by the Egyptians under Ibrahim Pasha in 1832, Damascus remained under the rule of Egypt until 1841, when, together with Syria, it was restored to Turkey. An uprising of the Moslem population in 1860 resulted in the destruction of the Christian quarter, and the massacre of about 6000 Christians. Consult: Porter, *Five Years in Damascus* (London, 1870); Macintosh, *Damascus and Its People* (London, 1882).

DAMASCUS BLADE. See DAMASKEENING.

DAM'ASK. The name given to certain textile fabrics in which figures are woven. The ornamental forms and the ground are usually of the same texture and color, but are distinguished from each other by being woven in opposite directions, the opposing threads causing the characteristic glittering contrast. The name is supposed to have been derived from the city of Damascus, where these fabrics were early manufactured. From the intricacy of the early process, the art of damask-weaving was long a mystery confined to a few localities; but since the introduction of the Jacquard loom (see LOOM) it is extensively employed in making ornamental satins, and particularly in the manufacture of table-linen. One variety of damask silk is called *brocatelle*. In this weave the principal ornamental figure is of a satin sheen, but a plainer weave is combined with it. The term *brocatelle* is also applied to a heavy and coarse brocaded or figured fabric in which wool or cotton is mixed with the silk, and which is largely employed for tapestry and upholstery. *Lampas* is woven like brocatelle, but the ground and figure are of different colors. *Diaper* is damask with the pattern arranged in geometrical figures, usually squares, with no ground pattern. *Brocades* are the most elaborate damasks, and often gold thread is interwoven with the silk. They are sometimes distinguished from ordinary silk damask by having the pattern raised slightly above the ground. For a more detailed description of silk damasks, consult Cole, *Ornament in European Silk* (London, 1899).

DAM'ASKEEN'ING, or **DAM'ASCEN'ING.** The art of producing upon ordinary steel

certain ornamental appearances resembling those on the famous Damascus blades. Attention was first drawn to this branch of industry by the Crusaders, who brought from Damascus to Europe many articles made of superior steel, such as sword-blades and daggers. These were found to possess not only great elasticity, united with considerable hardness, but their surfaces were covered with beautiful designs, formed by a tissue of dark lines on a light ground, or light lines upon a dark ground, and occasionally by the inlaying of gold on the steel-blue ground. In genuine Damascus blades the designs run through the substance of the blade, and the watering, or regular, almost symmetrical figuring, is not worn off by friction, or even grinding. Imitations of the watering of Damascus steel are produced on common steel by etching with acids; and in this way landscapes, inscriptions, and ornaments and decorations in general, are imprinted on the steel-blue ground. Gold and silver are also inlaid in the higher class of sword-blades and other articles. Gun-barrels are occasionally subjected to the process of damaskeening.

DAMASTES, *dā-mās'tēs* (Lat., from Gk. *Δαμάστης*, *Damastēs*), of SIGEUM, a Greek historian, a contemporary of Herodotus. According to Suidas, he wrote a *History of Greece*, a work on the *Ancestors of Those Who Warred Against Troy*; and a *Catalogue of Nations and Towns*. Strabo charges him with ignorance and credulity. The few extant fragments of his works are collected in Müller's *Fragmenta Historicorum Græcorum* (Paris, 1868-83).

DAM'ASUS. The name of two popes. DAMASUS I. (Pope 366-84). A Spaniard by extraction and the son of a priest, he was born in Rome about 305. In 355 he was made archdeacon. On his consecration to the episcopal office he was opposed by Ursicinus, who was the choice of a considerable faction, but finally acknowledged by all. His reign was far from peaceful. It was spent in subduing the still numerous Arians in the West, in combating the heresy of Apollinaris, which he caused to be condemned at the Council of Constantinople in 381, and in defending the cause of Paulinus against Meletius. He was a great friend of Saint Jerome, and was primarily instrumental in inducing him to undertake his translation of the Bible. His works are in Migne, *Patr. Lat.*, xiii. For his life, consult: Rade, *Damasus, Bischof von Rom* (Freiburg, 1882); Wittig, in *Römische Quartalschrift für christliche Alterthumskunde und für Kirchengeschichte*, 14th suppl. Heft (Freiburg, 1902). DAMASUS II. (Pope, 1047-48). He was a Bavarian by birth, and Bishop of Brixen, in Tyrol, when he was chosen Pope on the nomination of Emperor Henry III. He lived only twenty-three days after his solemn enthronization.

DAMAYANTI, *dā'mā-yān'tē*. The heroine of the Nalopakhyanam, or story of Nalay, in the Indian epic the *Mahabharata*.

DAMBACH, *dām'bäg*. OTTO (1831-99). A German jurist, born at Querfurt. In 1862 he was appointed justice of the General (now Imperial) Post-Office, Berlin. The laws on copyright in its various bearings, as well as the postal laws of the Empire, were devised chiefly by him. In 1873 he was appointed professor

extraordinary of law in the University of Berlin. His numerous writings include the following: *Fünfzig Gutachten über Nachdruck und Nachbildung* (Leipzig, 1891); *Das Telegrafien-Strafrecht* (2d ed., ib., 1897); *Das Gesetz über das Postwesen des Deutschen Reichs erläutert* (6th ed., ib., 1900).

DAMBUL, *dām-bōol'*. A vast rock-temple of the Buddhists in Ceylon, about 40 miles north of Kandy, containing, among a profusion of carvings, figures of Buddha of extraordinary magnitude.

DAME (OF, Fr. *dame*, from Lat. *domina*, lady, fem. of *dominus*, master, Skt. *damana*, conquering, Lat. *domare*, Gk. *δαμάω*, *daman*, Skt. *dam*, to tame; connected with OIG. *zam*, Ger. *zakm*, Icel. *tamr*, AS. *tom*, Engl. *tame*). A title of honor which long distinguished high-born ladies from the wives of citizens and of the commonalty in general. In the age of chivalry, it was customary even for a queen to be so called by her chosen knight (the dame of his heart, of his thoughts, etc.). Hence, too, the Virgin mother was called in France 'Notre Dame' ('our Lady'), as the mother of the whole human race. From *dame*, with the possessive pronoun *ma* prefixed, arose an ordinary title of honor, answering in modern French to the English 'Mrs.' The daughters of the King of France, as soon as they came into the world, were called *Madame*; and this was also the sole title of the wife of the King's eldest brother, who was himself simply known as *Monsieur*. In England the word 'dame,' though not much used, is now applied to married women of all classes. The word 'madam' or 'ma'am' is today the informal manner of address used in England for the Queen. A curious local usage at Eton College applies the title dame as well to men as to women in charge of boarding-houses for the boys.

DAME AUX CAMÉLIAS, *dām ô kâ'mâ'lyâ'*, LA (Fr., the lady of the camellias). A novel by the younger Dumas (1848), dramatized in 1852. It has been translated under the title *Camille*. The heroine is Marguerite Gautier, a courtesan.

DAME BLANCHE, *dām blānsh*, LA. A comic opera produced in Paris in 1825, the music being by Boieldieu and the words by Scribe; played in England, January 2, 1827, under the title of *The White Maid*.

DAMERON, *dā'm'rōn'*. CHARLES EMILE (1848—). A French landscape painter. He was born in Paris, and studied there under Pelouse. His first Salon picture was "The Court of an Inn at Cernay-la-Ville" (1872), and he often afterwards painted scenes in this locality. He was awarded a medal at the Centennial Exhibition, Philadelphia, in 1876, for his landscapes, "The Pyramids" and "The Oaks of Grand Moulin." These pictures are more remarkable from the point of view of composition and drawing than color, for his tones are dark and his shadows heavy.

DAMEROW, *dā'me-rō*. HEINRICH PHILIPP AUGUST (1798-1866). A German physician, born in Stettin. He studied medicine at the University of Berlin, and became professor extraordinary there in 1830. The following years of his life, with the exception of a few years dur-

ing which he held office in the Ministry of Public Instruction, he spent at Halle as director of a sanitarium for mental and nervous diseases. He is remembered for the important improvements that he introduced in the treatment of insanity and the management of asylums. His published works include the following: *Ueber die relative Verbindung der Irrenheil- und Pflegeanstalten* (1840); *Sefolge, eine Wahnsinnstudie* (1853); *Zur Kretinen- und Idiotenfrage* (1858). He was also one of the founders of the *Allgemeine Zeitschrift für Psychiatric*.

DAMES, dā'mēs, WILHELM BARNIM (1843-98). A German paleontologist, born in Stolpe. He studied at the universities of Breslau and Berlin, and became in 1878 professor of paleontology in Berlin and custodian of the department of paleontology at the museum there. Several of Dames's publications, especially those on fossil vertebrates, have been of the greatest importance, nearly all of them having appeared in *Paläontologische Abhandlungen*, issued in Berlin from 1883 to 1886, at which date the place of publication was transferred to Jena. Special features of his work are his descriptions of the echinoderms of the Jurassic and Tertiary; a memoir on the Jurassic bird *Archaeopteryx*; various publications on the ganoids of the Mesozoic, together with other shorter memoirs on the philogenetic relations of both the invertebrate and vertebrate fossils of Germany. Consult Frech, "Nekrolog an W. B. Dames," in the *Paläontologische Abhandlungen* (Jena, 1900).

DAME SCHOOLS. See COMMON SCHOOLS.

DAME'S VIOLET, *Hesperis*. A genus of plants of the natural order Cruciferae, which has four-sided or two-edged pods, and contains about twenty species, annual and biennial herbaceous plants, natives chiefly of the middle and south of Europe. The common dame's violet, or white rocket (*Hesperis matronalis*), cultivated in America to some extent, is found in Great Britain in hilly pastures, but has perhaps escaped from cultivation. It has an erect branched stem, with ovate-lanceolate leaves, and terminated by numerous large lilac flowers, which are scentless by day but very fragrant at night, on which account it is often cultivated in flower-pots by ladies, from which custom the plant appears to have derived its common name. The night-scented rocket (*Hesperis tristis*) is a favorite flower in Germany, numerous double, hardy, attractive forms of which are well known.

DAMGHAN, dām-gān'. A town of Persia, on the southern slope of the Elburz Mountains, 45 miles south of Astrabad. It is on the high road from Khorasan to Teheran, at an altitude of 3770 feet. It was a large city, containing 15,000 houses, in the reign of Shah Abbas, and has a ruined mosque and other remains of that period. It has a large export trade in nuts, especially of 'khaghazi' or thin-shelled almonds. The extensive ruins of Hecatompylos lie to the southwest. Population, estimated from 5000 to 10,000.

DA'MIAN. (1) The love-sick and not too scrupulous youth in Chaucer's *Merchant's Tale*, who seduces the wife of old January. (2) A youthful would-be Templar in Scott's *Ivanhoe*.

DA'MIA'NA. See APHRODISIACS.

DAMIANI, dā'mā-ā'nē, PIETRO (1006-72). A saint and doctor (1828) of the Catholic

Church. He was born in Ravenna in 1006 or 1007, and had a sad boyhood through neglect and cruelty. Feeling the call to the monastic life, he resigned a promising career as teacher and became a hermit at Fonte Avellana, near Perugia, in 1035, became prior in 1043, and did much to keep the monks up to their duties and to cure the abuses which had crept in. He also threw himself energetically into reform outside his monastery. He aimed at ridding the Church of the giant evils of concubinage and simony. To these ends he employed his promotion in 1057 to be Cardinal Bishop of Ostia, and his friendship with successive popes. He also endeavored to effect reforms through the German emperors. His efforts were, however, not always successful, as he could not secure the requisite backing; but he prepared the way for the greater reformer, Gregory VIII. He died at Faenza, February 23, 1072. His works are printed in Migne, *Pat. Lat.*, cxliv., cxlv. His *Liber Gomorrhianus* gives a frightful picture of the corruptions of the time. For his biography, consult J. Kleinermann (Steyl, 1882), Capecelatro (Florence, 1862).

DA'MIANISTS, or ANGELISTS. A sect of the sixth century, followers of Damianus, a Monophysite patriarch of Alexandria, who taught that there was only a single substance in the Godhead.

DA'MIA'NUS (Lat., from Gk. *Δαμιανός*). A celebrated sophist and rhetorician of Ephesus, who lived about A.D. 200. He taught rhetoric at Ephesus, and followed the methods of Adrianus and Ælius Aristides, of whom he had been a pupil. Philostratus, who was his contemporary, gives an account of his life in his *Lives of the Sophists* (*Βίοι Σοφιστῶν*, *Bioi Sophistōn*), but it is not known whether he left any writings.

DAMIEN DE VEUSTER, dā'myān' de vē'stār', JOSEPH (1840-89). A Belgian priest of the Roman Catholic Church, better known as Father Damien, and distinguished as a missionary to the leper settlement on the island of Molokai, Hawaii. He was born at Louvain, studied theology at the university there, entered the Society of the Sacred Hearts of Jesus and Mary in 1863, was appointed to the mission to the Hawaiian Islands, and until 1873 performed the customary duties of a missionary priest. In that year he was sent, at his own request, to the Molokai settlement established by the Hawaiian Government in 1865 for the enforced segregation of lepers and their maintenance at public expense in the villages of Kalaupapa and Kalawao. At his arrival in the island physical conditions among the lepers were thoroughly wretched. He found the water-supply unfit, the food bad, the people ill-washed, ill-clothed, and ill-housed. Forthwith he labored to obtain good water, wholesome food, suitable dwellings, medical assistance, and hospital accommodations. He organized religious worship, established schools, erected a general shop for leper trade, lent his own skilled hand to the building of the church at Kalaupapa, and even personally dug the graves of many of the hundreds of parishioners whom he buried. In the prosecution of his work he gradually gathered about him priests, lay brethren, and nuns as associates. In 1884 he perceived in the insensibility of his skin the sign of the approach of the disease,

and could begin his sermons with the words, 'We lepers.' He finally succumbed to the concentration of the leprosy in his lungs. His simple, heroic life and death attracted wide notice, and, in addition to the benefits secured by him for the immediate objects of his endeavors, led to agitation by Englishmen of the difficult leper problem in India. Many know his name chiefly through the famous *Open Letter to the Reverend Dr. Hyde*, written by Robert Louis Stevenson, first printed in the Sydney (New South Wales) *Presbyterian* of October 26, 1889, and privately published at Sydney as a pamphlet in 1890. Consult: Stoddard, *The Lepers of Molokai* (Notre Dame, 1885), and Father Pamphile, *Life and Letters of Father Damien* (London, 1889).

DAMIENS, dā'myān', ROBERT FRANÇOIS (1715-57). A French fanatic, known for his attempt to assassinate Louis XV. He was born near Arras, in France. Opium and accompanying dementia caused him to crown a life of idleness, mischief, and dishonesty with an attempt to kill the King of France. He himself alleged that it was the conduct of Louis toward the Parlement that drove him to the act; the opponents of the Jesuits sought to implicate them in this crime. On January 5, 1757, as the King was entering his carriage, bound for the Trianon, Damiens stabbed him in the side, but not seriously. All the agencies of slow fire, glowing pincers, and boiling oil were visited upon the poor wretch to make him reveal the names of possible accomplices. He confessed nothing, however. He was torn apart by four strong horses, and his remains were burned and his family was driven from France.

DAMIETTA, dā'mī-ēt'tā (Ar. *Damyāt*, Copt. *Damiati*, Lat. *Tamiathis*). A town of Lower Egypt, situated on the right bank of the eastern branch of the Nile (Map: Egypt, E 1), about eight miles from its mouth. It contains a number of ancient mosques, marble baths, and several bazaars. It is the seat of a governor and a Coptic bishop, and of a number of European consular representatives. The mouth of the river is closed by a bar which prevents the entrance of large vessels. In former years Damietta was a flourishing manufacturing and commercial centre, with a population of about 80,000. With the opening of the Suez Canal and the rise of Alexandria its commerce has declined considerably, and its manufacturing industries, with the exception of the weaving of cotton fabrics, have almost wholly disappeared. The cloth *dimity* is supposed to have received its name from Damietta, where it was first manufactured. The exports consist of rice, southern fruits, and wood. Damietta is connected by rail with Cairo and Alexandria, and contains a population of (1897) 31,515, including a few foreigners. The existing town was erected about 1251, but prior to that a city of the same name (anciently Tamiathis) stood about four miles to the south. It was strongly fortified by the Saracens, and formed on that side the bulwark of Egypt against the Crusaders, who, however, succeeded in capturing it more than once. It was razed and rebuilt further inland, on the site it now occupies, by the Sultan Bibars.

DAMIOTTI, dā'mé-ōt'té, DR. The Paduan charlatan in Scott's *My Aunt Margaret's Mirror*.

He shows the faithlessness of Sir Philip Forester in the enchanted mirror.

DAMIRON, dā'mé'rōn', JEAN PHILIBERT (1794-1862). A French philosophical writer. He studied under Burnouf, Villemain, and Cousin, lectured on philosophy in various Parisian institutions, and became professor in the Normal School and titular professor at the Sorbonne. He was for years a regular contributor to the *Globe*, and afterwards published his articles collected under the title *Essais sur l'histoire de la philosophie en France au XIX. siècle* (1828). His most important works are: *Cours complet de philosophie; Essai sur l'histoire de la philosophie en France au XVII. siècle* (1846), and *Mémoires pour servir à l'histoire de la philosophie du XVIII. siècle* (1858-64).

DAMIS, dā'mé'. The excitable and self-willed son of Orgon in Molière's *Tartuffe*.

DAMJANICS, dōm'yō-nīts, JOHANN (1804-49). An Hungarian revolutionist, born at Pancsova. He entered the Austrian Army, in which he rose to a captaincy; was received into the councils of Kossuth in 1848; and, at the outbreak of hostilities, organized a battalion, as commander of which he distinguished himself. Promoted to be general, he participated in the various operations leading to the Revolutionists' retreat, and after the disaster of Világos surrendered to the Russians, by whom he was turned over to Austria. He was condemned to death, and with twelve other generals was hanged by Haynau at Arad.

DAMMAR, or **DAMMAR PINE** (Hind. *dāmar*, pitch, resin), *Agathis*, formerly called *Dammara*. A genus of trees of the natural order Conifera, distinguished by their broad, lanceolate, leathery leaves, which have numerous nearly parallel veins. The name, originally applied to its resinous product, has been extended to a number of different trees, one of which is the Moluccan dammar (*Agathis orientalis*), which grows on the high mountain ridges of the Molucca Islands. It grows to a great height, attains a diameter of nine feet, and generally has the lower part of the trunk beset with knots as large as a man's hand. The timber is light and of inferior quality, and the tree is chiefly valuable for its resin, which is soft, transparent, hardens in a few days, and is then white, with a crystalline appearance. The resin often flows spontaneously from the tree in such quantity that it hangs in masses like icicles of a handbreadth and a foot long. At another period of the year it is yellow, and less valued. By incision, especially in the protuberances of the stem, it is obtained in large pieces. So long as dammar resin is soft it has a strong smell; upon drying this odor is lost. It contains only a trace of volatile oil, but consists of two distinct resins, one of which is soluble in alcohol, the other not. It is light, brittle, and easily friable, readily soluble in oil of turpentine. It is used in Asia for domestic purposes, and in the arts like other resins: it is an article of commerce, and in Europe is employed in various ways to form varnishes, which dry quickly, have a very bright lustre, are colorless, but readily become viscid again, and are not permanent, so that this resin cannot be made a substitute for copal and amber. It is almost completely soluble in benzole, and in this solvent

makes an excellent colorless varnish for positive photographs on glass. To this genus belongs also *Agathis Australis*, the Kauri pine (q.v.) of New Zealand, which produces the resin known as Kauri resin, or Kauri gum. The tree attains a height of 150 to 200 feet, and a diameter of 15 feet. The timber is straight-grained and very durable. The Kauri resin is dug from under the trees, masses weighing 100 pounds having been found. *Agathis robusta* is a valuable Queensland tree which has been successfully introduced in California. The resin known as black dammar is obtained in the Molucca Islands from the trunk of *Protium obtusifolium*, a tree of the natural order Burseraceæ. It is a semi-fluid, strong-smelling resin, which becomes black when dry; it is used as pitch, also to yield a kind of turpentine, which is obtained by distillation. *Canarium microcarpum* and *Canarium strictum*, trees of the same order, also natives of the farthest East, yield by incision of the trunk a viscid, odorous, yellowish substance, very similar to balsam of copaiva, which is called damar, or dammar, and is used in naval yards, mixed with a little chalk and the bark of reeds, for caulking boats. The resin called white dammar, or piney dammar, in India, often also called copal in India, is the product of *Vateria indica* and related species, large trees of the natural order Dipterocarpaceæ. It is obtained by wounding the tree, and when fresh is clear, fragrant, and acridly bitter; when dried it becomes yellow, brittle, and glass-like. It is used in India as a varnish ('piney varnish') which is hard, tenacious, and much esteemed. It is also made into candles in Malabar, which, in burning, diffuse an agreeable fragrance, and give a clear light with little smoke. *Shorea robusta*, the Sal (q.v.), so much valued in India as a timber-tree, of the same natural order, and some other species of *Shorea*, yield a resin, also known as dammar and as ral and dhoona, which is much used in dockyards in India as pitch. For illustration of *Agathis dammara*, see Plate of DAHLIAS.

DAMMARA. See KAURI PINE.

DAMMARTIN, dâ'mär'tän'. A family of distinguished French architects of the close of the fourteenth century.—ANDRÉ DAMMARTIN was architect of the Chartreuse, near Dijon (1383), in the service of the Duke of Burgundy.—GUY DAMMARTIN was architect of the Duke de Berri. Both were engaged on the Old Louvre and died about 1400.—JEAN DAMMARTIN was employed (1421-32) in the construction of the great cathedrals of Le Mans and Tours.

DAMNATION DE FAUST, dâ'nâ'syôn' de fôst, LA (Fr., the damnation of Faust). The title of a symphony-cantata by Berlioz, produced in Paris in 1846.

DAMOCLES, däm'ô-klêz (Lat., from *Δαμοκλῆς*, *Damoklês*). One of the courtiers and sycophants of the elder Dionysius, the tyrant of Syracuse. It is recorded by Cicero that Damocles, having lauded in the highest terms the grandeur and happiness of royalty, was shown the nature of this happiness by Dionysius in the following manner. He was seated at a table richly spread and surrounded by all the pomp of royalty, but in the midst of his luxurious banquet, on looking upward, he saw a keen-edged sword suspended over his head by a single

hair. The story had become proverbial in the day of Horace, who alludes to it in his *Odes*, iii. 1, 17ff.

DAM'ODAR. A river of India, rising in Ramgarh, a district in the Presidency of Bengal, and after a generally southeastern course of 350 miles, entering the Hugli from the right, below Calcutta (Map: India, E 4). The valley of the Damodar, traversed by the main railway between Calcutta and the northwest (the East Indian Railway), abounds in coal and iron. It is navigable from the mouth of its chief tributary, the Barakhar, which flows into it from the north.

DA'MON AND PHIL'LIDA. A mock pastoral in dramatic form by Cibber (1729), published anonymously.

DAMON (Lat., from Gk. *Δάμων*) AND **PHIN'TIAS** (Lat., from Gk. *Φιντίας*), commonly PYTHIAS. Two Pythagoreans of Syracuse, who have been remembered as models of faithful friendship. Pythias having been condemned to death by Dionysius, the Tyrant of Syracuse, begged to be allowed to go home, for the purpose of arranging his affairs, Damon pledging his own life for the reappearance of his friend. Dionysius consented, and Pythias returned just in time to save Damon from death. Struck by so noble an example of mutual affection, the tyrant pardoned Pythias and desired to be admitted into their fellowship. The story is told by Plutarch, *De Amic.*, and by Valerius Maximus, iv. 7.

DAM'OPHON (Lat., from Gk. *Δαμοφών*). A Greek sculptor of Messene, whose works were found chiefly at Messene, Megalopolis, and Lycosura. It was formerly supposed that he lived in the fourth century B.C., and that his statues were completed soon after the founding of Messene and Megalopolis under the auspices of Epaminondas. The discovery of fragments, including three heads, of the colossal statues at Lycosura, and the architectural evidence as to the date of that sanctuary, have led many scholars in recent years to assign Damophon to the first half of the second century B.C., though some (notably E. A. Gardner) still insist on the earlier date.

DAMOPHYLE, dâ-möf'i-lê, or **DAMOPH'ILA** (Lat., from Gk. *Δαμοφύλη*). A lyric poet of Pamphylia, who lived about B.C. 610. She was a pupil of Sappho, and like her, instructed other damsels. She is said to have written love poems and a hymn on the worship of the Pergæan Artemis, but none of her works is extant.

DAMOXY'ENUS (Lat., from Gk. *Δαμόξενος*). An Athenian poet of the new, and, probably, of the middle comedy. Two of his plays, *The Foster-Brothers* (*Σύντροφοί*) and *The Self-Tormentor* (*Ἐαυτὸν Πενθῶν*), are mentioned by Suidas and by Athenæus, who quotes a long passage from the former and a few lines from the latter work. The extant fragments of his works are published in Meineke's *Fragmenta Comicorum Historicorum*, vol. iv. (1839-57).

DAMPER. A door or valve which, by sliding, rising and falling, turning on a hinge, or otherwise, diminishes the aperture of a chimney or air-flue; this lessens the quantity of air that can pass through a furnace or other fire, and thus 'damps' or checks the combustion. The damper of a pianoforte is that part of the mechanism which, after a key is struck, and the finger

is lifted up from the key, immediately checks or stops the vibration of the string. It consists of a second hammer, which, on the rising of the key, strikes the string and remains upon it, instead of bounding off as the sounding-hammer does. Damper is also the name given in Australia to a simple kind of unleavened bread formed of wheat flour. It is made while traveling in the bush, and baked among the ashes of a fire.

DAMPIER, dām'pēr, WILLIAM (1652-1715). An English freebooter and explorer. He early went to sea with a party of buccaneers, crossed the Isthmus of Panama in 1679 and embarked on the Pacific with a considerable force in canoes and similar small craft, and captured several Spanish vessels, in which he cruised along the coast of Spanish America, waging war on Spanish subjects. In 1684 he engaged in another buccaneering expedition, in which he coasted along the shores of Chile, Peru, and Mexico, sailing thence to the East Indies, touching at Australia, and returning to England in 1691, where in 1697 he published an interesting account of the expedition, entitled *A Voyage Round the World*. He was afterwards (1699) deputed by the Government to conduct a voyage of discovery to the South Seas, during which he explored the west and northwest coasts of Australia, and the coasts of New Guinea, New Britain, and New Ireland, giving his name to the Dampier Archipelago and the Dampier Strait. In 1703-07 he made his third, and in 1708-11 his fourth trip around the world, the last time as pilot of the privateer *Duke*, which returned with specie and merchandise to the value of nearly £200,000. Besides his *Voyage Round the World*, he published: *A Discourse of Winds* (1699); *A Vindication of the Voyage to the South Sea in the Ship Saint George* (1707); and *Voyages to the Bay of Campeachy* (1729).

DAMPIER ARCHIPELAGO, dām'pēr är'ki-pěl'á-gō. A group of small islands northwest of and very near Australia, named after the famous navigator and buccaneer Dampier (Map: Australia, B 3). The principal ones are Barrow, Enderby, Rosemary, and Direction.

DAMPIERRE, dän'pyär', AUGUSTE HENRI MARIE PICOT, Marquis de (1756-93). A French general. He was born in Paris and entered the military service at the age of sixteen. After the battle of Valmy (September 20, 1792) Dampierre was made general of division, and by his skill and efficiency he contributed largely to the victory of Jemappes (November 6). He was subsequently placed in command of the centre at Neerwinden (March 18, 1793), where he stood his ground until the retreat of the left wing of the army. After the defection of Dumouriez to the Austrian ranks he assumed supreme command. He was mortally wounded May 8, 1793, while leading the attack on the intrenchments of Clerfayt, near the city of Condé.

DAMPIER STRAIT. (1) A strait separating the island of Waigiu from the Berau Peninsula of northwest New Guinea (Map: East Indies, H 5). It offers one of the safest channels from the Indian to the Pacific Ocean. (2) A strait separating New Britain from the east coast of New Guinea.

DAMPING OFF. A disease of plants induced by an excess of moisture in the soil and

atmosphere. Young seedlings in hothouses and hotbeds are particularly liable to it. Although the cause is sufficiently obvious, prevention is not always easy; not only because some plants are very sensitive to moisture, but also because the necessity of keeping sashes closed on account of temperature often stands in the way of the ventilation which would otherwise be desirable, and it is when a moist atmosphere stagnates around them, and the temperature is not very low, that plants are most liable to damp off.

The excessive moisture of soil and atmosphere gives the proper conditions for the development of the fungus *Pythium* or *Artotrogus debaryanum*, which is believed to be the immediate cause of the destruction of the plant. It is a soil fungus that lives on decaying vegetation until the conditions are right for attacking seedlings. If examined, the seedlings will be seen to show weak, thin spots near the surface of the soil and on account of this weakening the plant falls over and dies. The disease spreads with great rapidity in the seed-bed, so that in a few days all the plants may be reduced to a rotten mass. This fungus attacks many kinds of plants in the open ground, among which are mustard, cress, spurry, maize, clover, lettuce, egg-plant, peppers, cucumbers, melons, and forest-tree seedlings. Drying or freezing does not destroy the fungus or its spores. The best precautionary measures are to avoid infested soil, sow thinly, ventilate freely, shade little, water sparingly, and burn all diseased plants.

DAMROSCH, däm'rōsh, FRANK (1859—). A prominent American musician, son of Leopold Damrosch. He was born in Breslau. At first a clerk in a music store in Denver, he later drilled the chorus in the German opera in New York, which his father conducted. In 1892 he organized the People's Singing Classes in New York. Of these, now numbering about 1500 members, the more advanced form the People's Choral Union. They are most important factors in popularizing music, and their annual concerts are of a high artistic order. Damrosch also became conductor of the Oratorio Society, Symphony Society, president of the Musical Arts Society, and supervisor of music in the public schools of New York City.

DAMROSCH, LEOPOLD (1832-85). A German-American musician, violinist, composer, and conductor, born in Posen, Prussia. His parents chose the profession of medicine for him, and after graduating at the University of Berlin he returned to Posen to practice; but his passionate love of music, which he had continued to study incidentally, prevailed, and in 1854 he abandoned medicine for the study of counterpoint and composition under Hubert, Ries, and Dehn. In 1855 he started out as a concert violinist in Magdeburg; became acquainted with Liszt, and under his influence began to write for the *Neue Zeitschrift für Musik*. He was director in Posen and in Breslau, and in 1871 came to New York as director of the Arion Society. The credit of firmly establishing choral organizations in New York belongs entirely to Damrosch. He founded the Oratorio Society (1873) and the Symphony Society (1877), and organized several large musical festivals. All these played a most important part in the musical life of New York City. But the most brilliant achievement of his life was the successful establishment, in 1884, of

German opera in New York City, at the Metropolitan Opera House, notwithstanding the obvious difficulties of the undertaking. Among the operas given, *Fidelio*, *Tannhäuser*, *Lohengrin*, and *Die Walküre* were the most important as comparative novelties. He died in New York, and imposing funeral services were held in the Opera House. His works comprise several cantatas, a festival overture, beside violin concertos and songs.

DAMROSCH, WALTER JOHANNES (1862—). An American musician, son of Leopold Damrosch, born in Breslau, Prussia. He came to the United States, and was made conductor of the Harmonic Society of Newark, N. J., in 1881, and organist of Plymouth Church, Brooklyn, in 1884. In 1885 he succeeded his father as conductor of the Oratorio and Symphony societies, and became assistant conductor of German opera at the Metropolitan Opera House, New York. In 1894-99 he directed several operatic ventures, at first German, and subsequently French and Italian. In 1900-01 he conducted the German operas at the Metropolitan Opera House. He produced, in 1896, an opera, *The Scarlet Letter*, founded on the novel by Hawthorne, composed a *Te Deum*, in honor of Dewey's victory in Manila Bay, and shorter pieces and songs. His music is melodious, and the accompaniments to his songs are often striking.

DAMS AND RESERVOIRS. A dam is a barrier built across a stream or across a valley or other depression, to raise the level of water or to retain or store water for the supply of cities, towns, or villages, for irrigation, hydraulic mining, power, or manufacturing purposes. A reservoir is a basin or other receptacle used for receiving, storing, or distributing water. Reservoirs are often, but by no means always, formed by a dam connecting the banks of a stream or the sloping sides of a valley, canyon, or some more basin-like depression. The terms dams and reservoirs are used in speaking of devices to confine substances other than water; as when clay is used to hold back molten metal of any sort, or as in dentistry, where a dam is built by a dentist to keep saliva out of a cavity, or when a receptacle is attached to a stove, lamp, or machine for heating or storing water, oil, or other liquids, prior to or during use. The dams and reservoirs considered below will be only those constructed to retain water.

DAMS.

Where earth cannot be used, the choice of materials until quite recently has been between timber, timber and loose stone, and masonry. Within recent years a few dams of steel or of steel reinforced by masonry have been erected. Of course the greatest care must be taken to provide against dam failures, for which there are the following common causes: (1) By sliding on the base or on some horizontal joint; (2) by overturning; (3) by fracture due to tension; (4) by crushing, in the case of masonry dams; (5) by erosion, in the case of earth, or, though rarely, by breaking up and washing away, from the top downward, in the case of masonry structures. After a good site has been chosen and the utmost care devoted to the construction of the foundations and the supervision of the material and workmanship, the chief factor of safety in dam construction is obtained by placing a sufficient

volume and weight of material in the dam itself to withstand the pressure upon it. This pressure is directly proportioned to the height of water behind the dam and not to the total volume, as is sometimes supposed. In well-designed earth dams the cross-section is so great, for other reasons, as to give a weight far in excess of that which could be removed by the pressure of the retained water. But in masonry dams the cross-section may be proportioned to resist the pressure with mathematical nicety, allowing, of course, the factor of safety common to all good engineering work. In the new type of steel dams questions of volume and weight yield place to the tensile and compressive strength of the material.

A most essential feature in the design of dams of all classes is ample provision for passing waste or flood water. Otherwise the increased pressure against the up-stream face of the dam due to the excessively high water in the reservoir, or else the force of the current in passing over the top of the dam may cause a serious rupture. In overfall dams relief may be obtained, in some cases, by providing flood-gates at one end of the structure, either connected with or detached from the main dam; by having a crest to the whole dam which can be dropped in time of floods (see MOVABLE DAMS, below); or, in connection with one or both of the foregoing precautions, there may be an artificial overflow or waste channel leading from a spillway above or at one side of the dam down to the natural channel of the stream some distance below. Such a spillway and overflow channel are essential to all earth dams. It should also be noted that waste gates, or under sluices, are sometimes provided beneath the crest of masonry dams, particularly in India. These may be placed near the bottom of the reservoir to permit washing out deposits of silt. Where no other means are feasible, waste water may be carried to a point below the dam through a tunnel cut in the solid rock at one side and beyond the structure itself.

EARTH DAMS are formed by depositing the natural soil from the vicinity of the site in thin layers to form the structure and carefully rolling or otherwise rendering compact each layer before another is added. Water is sometimes applied to the earth to help compact it. Soil that will compact readily and be as little porous as possible should be selected, but it is difficult and generally impracticable to make earth dams impervious to water. Since continuous percolation through an earth dam would lead to its ruin, it is customary, where an attempt is not made to secure imperviousness through the whole structure, to place a water-tight barrier either on the upper face of the dam or at its centre. The former is known as a lining and the latter as a heart or core wall. Both a lining and a heart-wall may be used. Heart-walls may be composed of a carefully selected mixture of clay and loam or sand, called puddle; of concrete; or of stone masonry plastered with cement. One of the advantages of the heart-wall is that it can be carried well into the bed and banks of the valley, beneath and beyond the main part of the dam, which is a great safeguard against leaks between the natural ground and the artificial structure. Whether or not the upper face of the dam is lined to prevent leakage, it must be paved with stone, concrete, or brick to prevent damage to the earth slope by the action of the waves at

the water-level, which latter varies with the fullness or depletion of the reservoir. Where a water lining is desired, puddle is generally employed, often with concrete or masonry above it. Asphalt has recently been used to supplement concrete, brick, or stone lining. Occasionally the lower slope of earth dams is paved; in high dams it is frequently built with a level

that there were then ten earth dams 60 feet or over in height, as shown by the accompanying table. Later information shows that the fourth dam in the table, now known as the San Leandro, has a total height of 158 feet from the lowest point of the foundation to its crest, and has no heart-wall; also that it extends 125 feet above the original surface. The Tabraud dam, near Jackson, Cal., completed in December, 1901, has its crest 120 feet above rock foundation, and 110 feet above the natural surface of the ground. It has no heart-wall. See *Engineering News*, July 10, and September 11, 1902, for illustrated descriptions of the Tabraud and San Leandro dams, respectively.

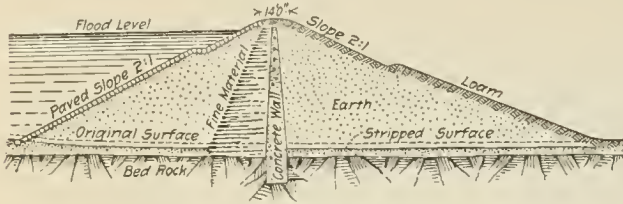


FIG. 1.—CROSS-SECTION OF EARTH DAM, with concrete heart-wall and upper slope paved; Metropolitan Water-Works, Southborough, Mass.

place or *berm* part way up its height. Water is rarely allowed to come within five feet of the top of earth dams or reservoir embankments and it may be kept even lower. The minimum advisable thickness of the base will increase with the height of the dam and the gentleness of the slopes. The angle of repose, or natural slope, of ordinary earth, dumped in banks, gives a base of one and one-half feet to one foot of height, but wet earth has a less angle of repose. It is common, therefore, to give dams of ordinary earth a slope of 2 to 1 on the lower or dry face, and 2½ or 3 to 1 on the wet face, and even these figures may be exceeded. Some earth dams are backed with loose stone or rock, to give greater stability. Occasionally the material composing earth dams is brought into place by means of flowing water, instead of by carts, scrapers, or buckets, running on and dumped

Earth dams or earth embankments for reservoirs are among the oldest of engineering structures, having been built for irrigation thousands of years ago, in Egypt, India, and other Oriental countries.

MASONRY DAMS, particularly of notable size, are of comparative recent origin, their construction having awaited the development of modern engineering. Moreover, while masonry dams of great height date from the sixteenth century (see table), it was only during the last half of the nineteenth century that their design accorded with the great principles of engineering—maximum strength with a minimum of material and cost. The accompanying table, taken from Wegmann, *The Design and Construction of Dams* (New York, 1899), will serve as a basis for tracing the development of the most notable masonry dams of the world during the last three centuries, terminating with the new Croton Dam, under construction in 1901. In 1900, or since the table was compiled, the contract was let

PARTICULARS OF TEN HIGH EARTH DAMS

NAME AND LOCATION	Height, ft.	Length, ft.	Heart-wall
Druid Lake, Baltimore, Md.....	119	Not given.	Puddle.
Pilarcitos, San Francisco, Cal.....	95	640	None.*
San Andreas, San Francisco, Cal.....	93	640	None.*
Lake Chabot, Oakland, Cal.....	80	900	Not given.
Middle Brauch, New York, N. Y.....	73	740	Rubble masonry.
Amsterdam, N. Y.....	65	410	" "
Kauffman, Pottsville, Pa.....	61	600	Not given.
No. 2, Oneonta, N. Y.....	60	...	Masonry.
Owego, N. Y.....	60	250	" "
Waverly, N. Y.....	60	322	" "

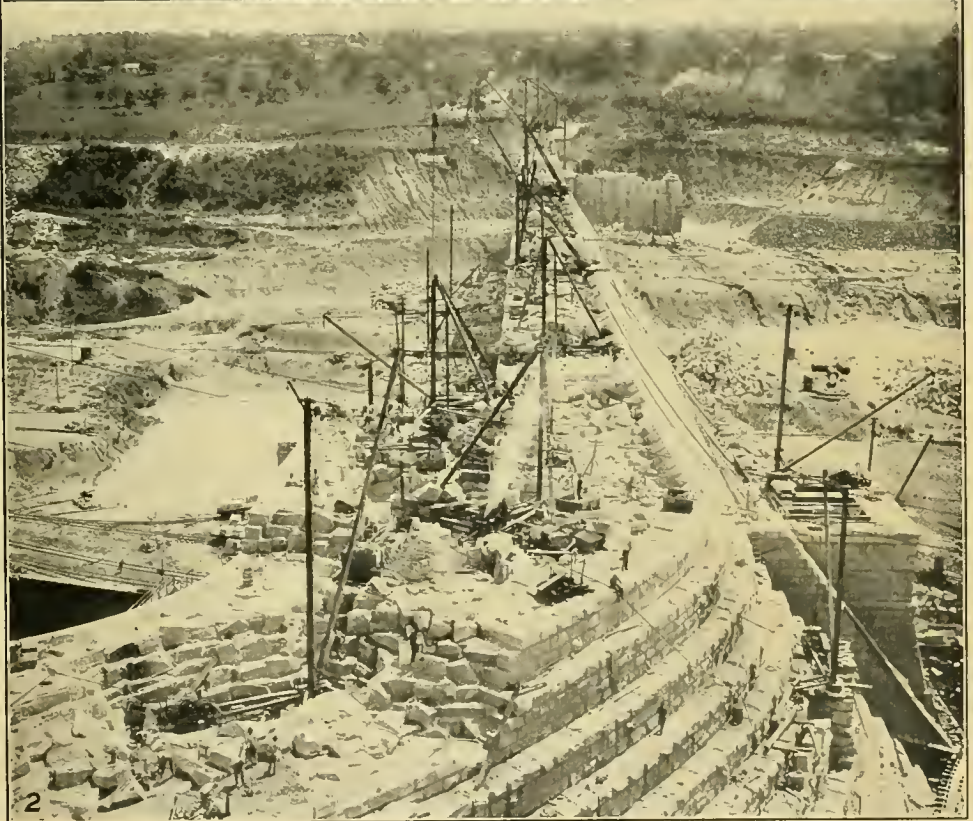
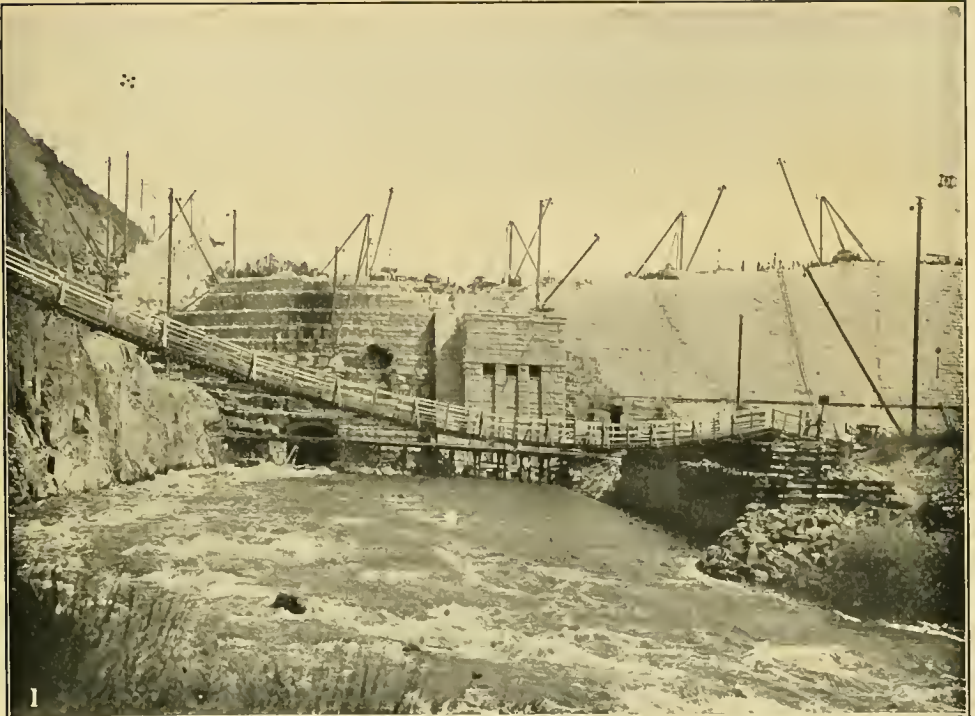
* These two dams, while without heart-walls in the dam proper, have puddle-filled trenches, 26 and 47 feet deep, respectively, from the natural surface to solid rock.

from a cableway (q.v.) *Hydraulic fill dams* is the name applied to this rather novel class of structures. This process was used to build a part of the San Leandro and Temescal dams of the water-works supplying Oakland, Cal., and also in building earth dams at La Mesa and San Joaquin (Lake Christine), Cal., and Tyler, Tex. Earth dams vary in height from a few feet to 100 feet or more, and in length from a few score to thousands of feet, or even to miles, although most of the structures running into miles are more properly called reservoir embankments. A summary of the heights of earth dams in the United States, for water-works purposes alone, compiled from figures included in *The Manual of American Water-Works* for 1889-90, showed

for the Wachusett Dam, which is a worthy rival of the new Croton Dam. Some figures concerning the Wachusett Dam and the Assuan Dam on the Nile (see *Reservoirs*, below) have been added to the table.

Masonry dams are designed as though they were monolithic structures, and for this reason, as well as because of the fact that the pressure against the face of the dam tends to rupture it both vertically and horizontally, the blocks of stone are not laid in regular courses. Portland cement mortar is used to bind the stones in one homogeneous mass, or the dam may be composed of irregularly shaped masses of stone with the intervening spaces filled with concrete, or it may be made of concrete alone. (See CEMENT.)

DAMS AND RESERVOIRS



NEW CROTON DAM IN COURSE OF CONSTRUCTION.

No.	Dam	Location	Date of construction	Depth of water	Height above bed-rock	Thickness in feet		Area of profile in sq. ft.	Maximum pressure in the masonry in tons per sq. ft.	Weight of masonry per cu. ft.	Length in feet		Plan
						At top	At base				At top	At base	
1	Alhauzu	Spain	Prior to 1586	67.88	67.88	9.84	33.73	1,496	14.33	.....	22.2	45	Curved; R = 86.06
2	Aleche	Spain	About 1870-90	76.12	76.12	29.52	39.37	2,615	13.00	.....	239	60	Curved; R = 265.53
3	Alehte	Spain	1579-1594	134.72	134.72	65.62	110.57	11,839	11.64	.....	190	30	Curved; R = 351.57
4	Lampy	France	1776-1782	51.35	52.17	16.08	36.65	1,229	8.12	.....	925	70	Polygonal
5	Pontest	France	1785-1791	153.54	164.24	35.73	444.20	16,349	6.66	.....	330	67	Polygonal
6	Valde Inherio	Spain	1785-1791	116.48	116.48	41.14	136.98	11,608	14.59	.....	1,965	.....	Straight
7	Gross-Bois	France	1800-1838	92.90	92.90	21.53	45.38	2,503	6.14	.....	.....	.....	Straight
8	Vionnet	France	1833-1838	32.81	36.09	24.61	21.61	872	8.61	.....	.....	.....	Straight
9	Bosmeda	France	1833-1838	46.31	50.20	14.11	57.88	987	9.41	.....	.....	.....	Straight
10	Clouet	France	1833-1838	39.04	42.94	13.78	24.54	774	.....	.....	.....	.....	Straight
11	Tillet	France	.....	65.62	65.62	17.88	17.88	1,173	.....	.....	.....	.....	.....
12	Chazilly	France	.....	73.80	73.80	13.39	53.15	.....	.....	.....	.....	.....	.....
13	Zola	France	About 1843	153.02	153.02	13.03	41.83	3,645	8.12	.....	1,730	23	Curved; R = 158.00
14	Nizay	Spain	1843-1850	82.03	96.43	24.28	67.59	5,346	7.68	.....	203	.....	Curved
15	Lozoya	Spain	1852	106.03	106.03	21.98	127.96	9,052	6.82	.....	290	.....	Straight
16	Fareus	France	1862-1866	164.04	170.60	9.91	81.62	10,712	7.15	.....	328	.....	Curved; R = 898.38
17	Tereyau	France	1865-1868	112.70	124.68	13.12	81.69	4,355	7.15	.....	.....	.....	Curved; R = 1312.40
18	Habra	Algeria	1865-1873	116.81	124.68	14.11	95.00	5,284	6.31	.....	1,476	.....	Straight
19	Agliari	Italy	1866	70.54	70.54	16.40	52.50	2,430	.....	.....	.....	.....	.....
20	Verdon	France	1866-1870	58.00	58.00	14.99	52.50	863	5.81	.....	131	.....	Curved; R = 108.83
21	Boyd's Cornet	U. S.	1866-1872	78.00	78.00	8.60	57.00	2,039	.....	.....	.....	.....	Straight
22	Ban	France	1867-1870	56.82	56.82	16.40	126.38	6,780	8.18	.....	.....	.....	.....
23	Théat	Algeria	1869	68.30	68.30	13.12	40.34	.....	.....	.....	.....	.....	.....
24	Gileppe	Belgium	1869-1875	147.64	154.20	49.22	216.50	18,208	6.14	.....	771	.....	Curved; R = 1640.40
25	Villar	Spain	1870-1878	102.30	170.33	14.75	151.50	11,366	9.60	.....	546	.....	Curved; R = 440.00
26	Pas du Rho	France	1872-1878	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
27	Djadonia	Algeria	1873-1875	83.67	83.67	13.12	52.50	.....	.....	.....	.....	.....	.....
28	Geelong	Australia	.....	60.00	60.00	2.50	44.00	1,214	4.05	.....	106	.....	Straight
29	Proton	India	.....	108.00	108.00	13.75	60.75	3,255	4.00	.....	226	.....	.....
30	Bojpur	India	.....	73.09	73.09	18.74	30.35	2,521	6.70	.....	.....	.....	.....
31	Bojpur	Spain	1880	141.08	141.08	16.40	146.38	5,454	5.12	.....	236	.....	.....
32	Gonzalez	France	1882	121.40	126.32	13.12	45.00	5,031	11.26	.....	1,545	.....	Straight
33	Bonzy	France	1882	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
34	Grand Chenilais	France	1882-1884	131.54	131.54	13.12	131.52	1,361	6.14	.....	569	.....	.....
35	Pont	France	1883	85.31	85.31	16.40	92.34	2,755	.....	.....	.....	.....	.....
36	Hantz	Algeria	1885	134.32	134.32	16.40	91.21	5,629	11.25	.....	495	.....	.....
37	Bridgeport	U. S.	1886-1888	40.00	40.00	20.00	117.80	8,972	8.70	.....	1,350	.....	Straight
38	Vydney	England	1882-1889	116.25	116.25	.....	.....	.....	.....	.....	.....	.....	.....
39	Vingeanne	France	1885	131.25	131.25	.....	.....	.....	.....	.....	.....	.....	.....
40	Rapel	France	1888-1892	131.43	131.43	11.38	80.12	.....	.....	.....	.....	.....	.....
41	Sobalay	France	1885	131.43	131.43	.....	.....	.....	.....	.....	.....	.....	.....
42	Tyshan	China	1888	157.00	157.00	23.47	62.95	3,978	.....	.....	.....	.....	.....
43	Sun Mateo	U. S.	1887-1889	170.00	170.00	50.00	175.00	16,630	.....	.....	.....	.....	.....
44	Sodon	U. S.	1888-1893	98.00	98.00	12.00	53.00	.....	.....	.....	.....	.....	.....
45	Faurel	India	1886-1891	118.00	118.00	12.00	100.00	.....	.....	.....	.....	.....	.....
46	Swart Valley	U. S.	1884	63.00	63.00	3.17	20.00	537	9.00	.....	470	.....	.....
47	Sweetwater	U. S.	1886-1888	98.00	98.00	12.00	46.00	2,347	.....	.....	.....	.....	.....
48	Bladant	India	.....	130.00	130.00	12.00	74.00	.....	.....	.....	.....	.....	.....
49	Prithi	India	.....	69.00	69.00	.....	.....	.....	.....	.....	.....	.....	.....
50	Prithi	India	.....	180.00	180.00	12.00	136.00	.....	.....	.....	.....	.....	.....
51	Mordado	Australia	.....	110.00	110.00	14.00	110.00	.....	.....	.....	.....	.....	.....
52	Mordado	France	1880	101.00	101.00	.....	.....	.....	.....	.....	.....	.....	.....
53	Charday	France	1892	67.00	67.00	.....	.....	.....	.....	.....	.....	.....	.....
54	Peckin	U. S.	1892	120.00	120.00	10.00	83.00	.....	.....	.....	.....	.....	.....
55	Peckin	U. S.	1893-1895	135.00	135.00	18.00	75.00	5,249	.....	.....	.....	.....	.....
56	Lehrer	Germany	1889-1892	92.00	92.00	13.12	49.21	.....	.....	.....	.....	.....	.....
57	Lehrer	Germany	1890	125.00	125.00	24.00	90.00	.....	.....	.....	.....	.....	.....
58	Elmsted	Germany	1890-1894	92.00	92.00	13.10	65.50	.....	.....	.....	.....	.....	.....
59	Hempel	U. S.	1891-1895	135.50	135.50	10.00	100.00	.....	.....	.....	.....	.....	.....
60	Wierwahn	U. S.	1893-1896	75.00	75.00	.....	.....	.....	.....	.....	.....	.....	.....
61	Now Croton	U. S.	1892	293.00	293.00	18.00	200.00	.....	.....	.....	.....	.....	.....
62	Assauk	Egypt	1898	90.00	90.00	25.00	80.00	.....	.....	.....	.....	.....	.....
63	Wachuseff	U. S.	1900	290.00	290.00	22.50	175.00	.....	.....	.....	.....	.....	.....

1. Puente failed April 30, 1802.

2. Habra failed in December, 1881.

3. San Mateo not above 134-foot level (1901).

4. Colorado River (Abstin) failed April 7, 1900.

Overturning is guarded against by giving the structure such a cross-section that the lines of pressure will be thrown within the centre third of the dam. To provide against crushing, a material with high resistance to such action is selected and the structure is so proportioned that

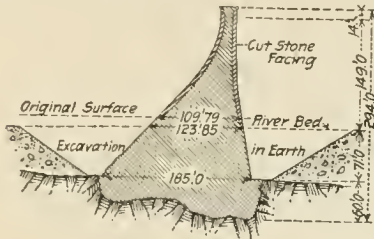


FIG. 2.—CROSS-SECTION OF A MASONRY DAM
(New Croton Dam for New York City Water-Works).

its own weight will not crush the material in its lower part. As a general rule the pressure should never exceed fifteen tons per square foot, and with some materials it may need to be as low as six tons. Obviously the only way to prevent excessive or crushing pressures at the bottom of very high dams is to diminish the thickness as the height increases. The action of ice and of the actual or possible current of overflowing water renders it necessary to make the top of the dam thicker than would be required to resist water pressure alone; otherwise the dam might be tapered to a knife edge at the top. The common type of cross-section for high masonry dams approaches a right-angled triangle, with the perpendicular side up-stream, but it varies from a real triangle in having both sides curved somewhat, particularly so as to give a broader base, and in having the extreme upper part built with nearly parallel sides, while the top is flat, or perhaps more or less rounded. While some of the early dams were quite bold in cross-section, most of them were far otherwise. The French engineers were the first to apply the results of theoretical study of the subject to the design of the cross-section of dams. M. Sazilly discussed the questions involved in a memoir published in *Annales des Ponts et Chaussées* (Paris, 1853). M. DeLoere carried the work on to more rational conclusions, which were made public in 1858, and on which the design of the Furens Dam, near Saint Etienne, France, was constructed (1862-66). A memoir on these studies was published in the journal just named in 1866. Although this dam was only 6 feet higher (170.6 against 164.24 feet) than the Puentes Dam, completed in Spain in 1791, the French dam was 9.91 feet thick at the top and 161.02 at the base, while the Spanish dam was 35.73 feet thick at the top and 144.29 feet at the base. The French dam was curved in plan and the Spanish was polygonal. An Englishman, Prof. W. J. Rankine (q.v.), made the next notable study of the subject. (See his *Miscellaneous Scientific Papers*, London, 1880.) A number of eminent American engineers connected with the new Croton Aqueduct and its adjuncts, for New York City, made studies which resulted in the design of the highest masonry dam yet attempted, which was put under construction in 1892. Very extensive investigations were made in this connection by Mr. Edward Wegmann, who published

an important treatise, entitled *The Design and Construction of Masonry Dams* (New York, 1888), to which new matter was added and a new title given in 1899, so as to cover all classes of dams.

ARCHED or CURVED DAMS have given rise to a great amount of discussion as to the possibility of utilizing the arch principle to resist a part of the thrust of the water on the dam, instead of relying wholly on gravity dams, or those with a section which gives sufficient weight to resist overturning and sliding. The most notable dams designed on this principle are the Bear Valley, Zola, and Sweetwater dams, details of which are given in the table. The first two are declared by Mr. James D. Schuyler, in his work on reservoirs (see below), to be "so slender in profile as to be absolutely unstable were they built straight." The Bear Valley Dam is only 3.17 feet thick at the top, 20 feet thick at the bottom, and is 60 feet in height.

CONCRETE MASONRY DAMS are not essentially different from other masonry structures, except in their composition. (See CEMENT and CONCRETE.) Perhaps the most notable concrete dam in the world is that near San Mateo, Cal., built by the Spring Valley Water-Works Company of San Francisco. This dam, which is of the arched type, had attained a height of 13.4 feet in 1888 or 1889, but is designed to reach ultimately 170 feet, with a top width, when completed, of 25 feet and a width at the base of 176 feet.

ROCK-FILL DAMS are built of large stones, or rock, loosely put in place, but with hand-laid face or slope walls. To make such dams water-tight, or sufficiently so for the objects to be attained, the up-stream or wet slope may be faced with plank, concrete, concrete and asphalt, or steel. It is also possible to use earth to form either the upper or lower section; or riveted steel plates may be built in the centre of the structure. A masonry wall, with earth above and rock fill below, faced on the lower slope with stone laid in mortar, is another variation. The adoption of this form of construction is generally in the interests of economy, in localities where the transportation of cement would be very costly, where earth dams are out of the question, and where stone is abundant and easily thrown into place. The Escondido Dam, built by a Cali-

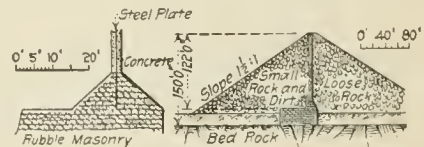


FIG. 3.—ROCK-FILL DAM WITH STEEL HEART-WALL OR DIAPHRAGM.
Southern California Water Company, San Diego, Cal.

fornia irrigation district of that name, is one of the most notable of the rock-fill structures. It is 76 feet high, 10 feet thick at the top, and 140 feet thick at the base, has top and bottom lengths of 380 feet and 100 feet respectively. The hand-laid dry wall on the upper or wet slope is 15 feet thick at the base and 5 feet at the top. It is covered with redwood plank and the space between the plank and the stone was rammed full of concrete. The joints in the planking were calked with oakum and daubed

with asphalt. The Lower Otay Dam, near San Diego, Cal., completed in 1897, is a rock-fill dam with a steel core. The dam was started in masonry, but being carried to a height of 40 feet above its lowest point, when its top length was only 85 feet, it was decided to change the design. An inverted T-iron (thus, \perp) was bolted to the masonry and steel plates one-third of an inch thick, $17\frac{1}{2}$ feet long, and 5 feet high were riveted first to the T-iron, then to each other until three courses had been placed. The plates were diminished in thickness as they neared the top. The dam is 161 feet high above its lowest point, 130 feet high above the natural earth, and is of rock fill for 121 feet. The steel plates were protected by a coat of hot Alecatraz asphalt, then a layer of burlap, then harder asphalt, and finally one foot of Portland cement concrete, on each side. A part of the rock fill was deposited in place by the force of a very heavy blast and the rest was transported from the quarry by a cableway (q.v.) 948 feet long. Nearly 180,000 cubic yards of stone were used. The stream flow must be passed around and not over rock-fill dams.

STEEL DAMS have recently been built. One of the first of these, known as the Ash Fork, was built about 1897 or 1898, by the Atchison, Topeka and Santa Fé Railway Company to supply

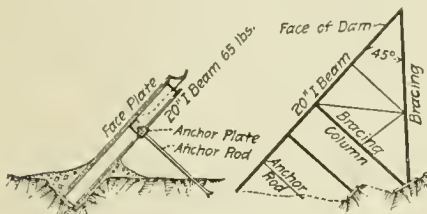


FIG. 4.—CROSS-SECTION OF STEEL DAM,
Ash Fork, Ariz.

its engines and incidentally to furnish water to the village of Ash Fork, Ariz. It forms a reservoir of 36,000,000 gallons capacity. The steel portion of the structure is 184 feet long at the top and its greatest height is 46 feet. It consists of a series of triangular steel frames, against the upper sides of which rest the riveted steel plates, three-eighths of an inch thick. These plates are curved so as to form a series of channels from the top to the bottom of the inclined face of the dam, with flat strips between. Water flows over the top of the steel dam and between two masonry abutments having a combined length of 116 feet.

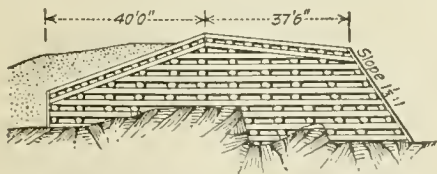


FIG. 5.—CROSS-SECTION OF TIMBER AND STONE DAM,
Bangor, Me.

TIMBER DAMS include a great variety of structures built of framed timber, logs, and crib-work of either timber or logs filled with stone. They are generally comparatively low, overflow dams. They frequently have a sloping up-stream face

and either a sloping or stepped down-stream face, with an apron below the toe of the latter, to break the force of falling water. Sometimes piles are used in their construction and often earth is filled against their upper side. The once famous timber dam at Holyoke, Mass., built in 1849 for water-power, 1017 feet long and with a maximum height of 30 feet, has been replaced by a masonry structure.

MOVABLE DAMS are those which can be lowered or raised at will, according to the stage of water in the river. They are generally aids to navigation, placed at stretches where there are shallows or rapids, but where permanent structures to raise the water-level might do damage by causing floods at times of high water. They may also be used on any ordinary dam, or on waste weirs. It is more common, however, to call movable devices connected with ordinary dams *flashboards* or *floodgates*. Flashboards are generally comparatively low and are of fragile construction, or have supports designed to give way in time of freshet. There are a great variety of movable dams, but they fall more or less closely into three groups—*needle*, *wicket*, or *shutter*, and *bear-trap*. The latter have some decided points of superiority, being raised and lowered by the force of the water itself, on its being turned under or discharged from chambers beneath or within the dam. *Needle dams* were developed in France about the close of the eighteenth century. They are an outgrowth of the earlier French and English needle dams and consist of horizontal beams, or stop planks, dropped into grooves built in the two abutments of a pass through the dam. These beams could be lifted out at times of high water. Later, to facilitate handling, they were set vertically, or nearly so, resting against a sill below and a beam above. A chain was finally substituted for this beam to make greater lengths of dam feasible. In this way movable dams 40 feet wide were developed on the Yonne, in France. In 1834 M. Poirée increased the width of one of these dams, or passes, to 72 feet by substituting iron bars for the chains. The bars were short and were supported by means of vertical, iron frames, placed at right angles to the length of the dam. To throw down the dam, it was only necessary to remove the needles one by one, detach the horizontal bars, then lower the frames into recesses in the top of the masonry portion of the dam. The needle dams were somewhat modified subsequently and used in various parts of France, in Belgium, in Germany, and in the United States. The first needle dam in this country was built in 1891-97 by the United States Government across the Big Sandy River at Lonisa, Ky. The whole improvement includes a lock 52 feet wide, a navigable pass 130 feet long, and an overflow weir 140 feet long. The sill of the pass is 13 feet and that of the weir is 7 feet below the normal height of water in the pool, and the sill of the pass is one foot below low-water mark of recent years. The steel frames supporting the pass needles are four feet between centres. The horizontal bars connecting the frames and supporting the upper ends of the needles are hinged at one end and hooked at the other. The frames have a sheet-iron floor, forming a foot-bridge, which falls with them, and are connected by a chain. The pass needles are of white pine, 12 inches wide, $8\frac{1}{2}$ inches thick at the bottom, and $4\frac{1}{2}$ inches thick

at the top, and 14 feet 3 inches long, each weighing 263 pounds when wet. The needles are set in place by means of a derrick on a boat, and are lifted out by means of a chain passing through irons fastened to their top, operated by an engine. The frames are raised or lowered from one of the abutments to the pass by means of a chain crab.

WICKET or SHUTTER DAMS have been developed from simple gates or shutters working on a horizontal axis near their tops, which have been used in Holland for centuries. These simple shutters have been elaborated until they are now made of short lengths, which may be revolved on their horizontal axis, then lowered so as to rest flatwise on the sill of the dam. They are operated from a bridge placed above them, which can be lowered much the same as the frames of the needle dams just described. In 1880 two wicket dams were completed on the Great Kanawha River by the United States Government, and others have since been built on that stream. One, completed in 1892, has a pass 248 feet long; besides a weir 316 feet long and a lock 55 feet wide. The pass is closed with 62 Chanoine wooden wickets 3 feet 9 inches long and 14 feet high, with a three-inch space between them, which may be closed by means of a timber, if desired. The first of a series of movable dams in the Ohio River, at Davis Island, near Pittsburg, was built in 1878-85, and also has Chanoine wickets. There is one pass 716 feet long, another 1223 feet long, besides a fixed dam 456 feet wide, several weirs, and a lock 110 feet wide and 600 feet long between the gates. In 1899 a second Chanoine wicket dam was being built across the Ohio River 25 miles below Pittsburg.

DRUM DAMS are modifications of the wicket or shutter dam. One of these, named after its inventor, Capt. H. M. Chittenden, may be described, roughly, as being shaped like one-sixth of a cylinder. When lowered by revolving on a horizontal axis at the centre of the cylinder, it drops into the chamber, leaving one radial side of the cylinder flush with the sill. The sections are raised by the force of the water acting from beneath.

BEAR-TRAP DAMS or GATES, in their simplest form, consist of two leaves extending across the pass or opening to be closed, and so hinged to the sill of the dam on their outer edge that they form a triangle when in use and lie flat on the sill of the dam when open; one leaf, when open, overlaps the others. The space within the triangle is filled with water. On drawing out this water through suitable openings, the dam fills, and on admitting water beneath the leaves, when the dam is open, the leaves are raised slowly into position. Thus the dam is operated by the force of the water. The first dam of this type was built on the Lehigh River, in 1818 or 1819, by Josiah White and Erskine Hazard, managers of the Lehigh Navigation Company, to secure slack water for shipping anthracite coal. Until 1880 or later this type seems to have been used but little outside of Pennsylvania; but in 1886 two bear-trap gates, each 60 feet long, were built by United States engineer officers in the Beattyville Dam, across the Kentucky River. Since 1886 a number of other dams of this type have been built in this country. A study of bear-trap dams was made for the United States Government by Capt. H. M. Chittenden and Major A. O. Pow-

ell, beginning in 1892. (See *Journal Association Engineering Societies*, Philadelphia, for June, 1896; also an article by Captain Chittenden reviewing the whole subject, in *Engineering News*, New York, February 7, 1895.) Various modifications of the bear-trap dam have been made, including a hinge at the apex and another in the upper leaf, so in falling the dam falls over on itself, and there is no overlapping at the apex. The largest bear-trap dam yet built forms a part of the regulating works of the Chicago Drainage Canal (q.v.), where the canal discharges into the Des Plaines River. The pass closed by this dam is 160 feet long and 20 feet high, besides which there are 15 sluice-gates, 30 feet wide and 20 feet high, working vertically between masonry piers. Eight of the gates were walled up, as the full capacity was not deemed necessary for some time. This bear-trap dam is not for navigation, so it is mounted on a masonry structure of some height, permitting the upper gate to slide down the upper face of the masonry. This dam differs from others of the same type not only in being of steel instead of wood, but in having various mechanical devices to supplement its operation. A full illustrated description of this structure is given in *Engineering News* (New York) for March 24 and May 26, 1899. A general review of movable dams, by B. F. Thomas, is given in the *Transactions of the American Society of Civil Engineers* (New York, 1888); also see *Reports Chief of Engineers, United States Army* (Washington, 1860 et seq.), particularly those for 1884 and 1887.

COFFERDAMS (q.v.) are employed to exclude water from foundations and other classes of work while under construction. See FOUNDATIONS.

FAILURES OF DAMS.

The Bradford earth dam, Sheffield, England, failed in March, 1864. This dam, built to supply water and furnish power to the city of Sheffield, was about 90 feet in height, 13 feet wide, and 1250 feet long, with slopes of $2\frac{1}{2}$ to 1. The dam, except for a puddle wall extending from end to end and 60 feet into the ground, was of earth loosely dumped from carts. Cast-iron outlet pipes about 500 feet in length, surrounded by clay puddle, extended through the base of the dam. While the reservoir was being filled for the first time, a leak suddenly appeared, and enlarged so rapidly that in 30 minutes the reservoir had emptied itself. The flood reached Sheffield at midnight, without warning, causing great destruction of property and the loss of 238 lives. In the official inquiry made as to the cause of the failure, it was claimed that in a work of such great magnitude the outlet pipes should not have been placed through the dam itself.

The failure of the Mill River Dam at Williamsburg, Mass., in 1874, was a conspicuous example of improper construction which resulted in complete saturation of the embankment. No engineer had been employed in constructing the work, and no proper means used for consolidating the embankment. One morning, when the water was 4 feet from the top of the dam, masses of earth were observed to slide from the outer slope of the embankment. In 20 minutes the reservoir was emptied of 100,000,000 cubic

feet of water, which drowned 143 persons and destroyed \$1,000,000 worth of property.

The most disastrous reservoir failure of the nineteenth century was the destruction of the South Fork Dam, which caused the famous Johnstown flood on June 1, 1889. That this disaster was due to an insufficient wasteway has been abundantly proved. The South Fork Dam was built on the headwaters of the Conemaugh River, about 3 miles above Johnstown. It was of earth, 70 feet in extreme height. The dam was built as far back as 1852, and, after various changes in ownership, the reservoir, in 1880, came into the possession of the South Fork Hunting and Fishing Club of Pittsburg, Pa. The original specifications for the dam required a waterway 150 feet wide. The waterway existing at the time of the disaster was 130 feet wide at its upper end, but was obstructed by a bridge and by screens to prevent the escape of fish. It extended across a channel 176 feet long, and at its lower end only 69 feet wide. In other words, the waste was only half that originally contemplated, besides which a brick outlet culvert had been abandoned. Unusually heavy rains had been falling for several days, and for 3½ hours before the break occurred the water had been flowing over the entire length of the dam. When the dam was carried away, the reservoir emptied itself in about 45 minutes. Over 2000 lives were lost in this disaster, and between \$3,000,000 and \$4,000,000 worth of property.

The Walnut Grove Dam, in Arizona, failed on February 22, 1890. It was one of the highest rock-fill dams ever built, having been 110 feet in height, about 10 feet thick at the top and 140 feet at the base, with a top length of some 400 feet and a bottom length of 100 feet. Both faces were composed of granite blocks, laid by hand and derrick, these dry-face walls being 20 feet thick at the base and 5 feet thick at the top. It is supposed that a very heavy rainfall and an altogether inadequate spillway caused the destruction of the dam, which was overtopped for a number of hours. Many deaths resulted from the failure.

The failure of the Puentes masonry dam, in Spain, in 1802, was due to defective foundation, the central part of the dam resting upon piles, instead of being carried down to bed rock. In the Habra masonry dam, in Algiers (see table), whose failure caused the drowning of 400 persons, the disaster was probably due to defective masonry work. The failure of the Bonzey masonry dam, near Epinal, France, in 1895, was caused by defective construction between the base and the foundation, although in its dimensions the dam was carried to the extreme of lightness. The failure of the dam on the Colorado River, at Austin, Tex., which occurred in April, 1900, was due to defective foundation, largely on account of the soft limestone rock on which the foundation was laid. The dam was 1090 feet long, 66 feet high above the foundation, and 60 feet above low water. The upstream face of the dam was vertical, and the down-stream face was curved, giving a thickness of 66 feet at the base and 20 feet near the top. On April 7, 1900, after a heavy rainfall of several days, when the water was flowing over the crest of the dam to a depth of 11.07 feet, a portion some 500 feet in length was detached from

the remainder of the dam, broke into two parts, and was carried down-stream. Two sections were left standing upright in the stream a few feet below the original portion. One of these broke up in a few hours, but the other remained intact. When the dam broke, eight people in the power-house were drowned by the sudden rush of water, and during the following night the power-house itself was partially destroyed.

RESERVOIRS.

Reservoirs may be classified broadly into *impounding, settling, storage, and distributing* reservoirs, all of which, except impounding, may be covered or open, the latter being the general form. *Impounding reservoirs* are formed by throwing a dam across some stream and flooding the country above. *Storage reservoirs* are often created in the same way; or they may be formed more or less completely by embankments or excavation, or a combination of the two. Both impounding and storage reservoirs are designed to conserve a supply of water above the normal consumption, for times when either the natural yield is below the average or the consumption is unusually great. Impounding reservoirs are always for storage purposes, whether the capacity be for a few hours' supply or for a much longer period. The larger and more regular the daily yield of the stream or other source of supply, as compared with the consumption, the smaller need be the storage capacity. In some cases storage is required for months, or even for a year. The new Croton Dam will provide a storage of about 32,000,000,000 gallons, or nearly enough to supply the whole of Greater New York (3,438,000 people in 1900) with 100 gallons each for 100 days. The Wachusett Dam, of the Metropolitan Water-Supply District (Boston and vicinity), will retain about 63,000,000,000 gallons of water. It is located at Clinton, Mass., and ranks next to the new Croton Dam in height (see table of dams above for dimensions), but has almost double the storage capacity. The Periyar, or Periar, Dam in India (see table) forms a reservoir larger than either of the last two, having, as it does, a total capacity of about 100,000,000,000 gallons; but the outlet tunnel is at so high a level that only about one-half of this capacity can be utilized. Still greater will be the capacity afforded by the great Assuan Dam, now being built (see table) across the Nile, some 500 miles above Cairo. The storage here will be about 280,000,000,000 gallons, or sufficient to cover 6,400,000 acres of land to a depth of one foot. The Periyar and Assuan dams are for irrigation purposes.

An important sanitary question involved in the construction of impounding and storage reservoirs for public water-supplies is the stripping of the sites, or flooded areas, of all heavy accumulations of organic matter which, either through their decay or through serving as a food-supply to low forms of life, would impart unpleasant tastes and odors to the stored water. It is a common practice to remove stumps and timber and to burn over the site, where practicable, before filling such reservoirs; but outside of New England very little more than this has been done toward stripping the sites of storage reservoirs. The estimate for the Wachusett Reservoir, mentioned above, included \$2,910,000, out of a total cost of \$9,105,000, for stripping the reservoir site. Aside from stripping and clear-

ing the sites, the construction of impounding reservoirs pertains mostly to the dam and its accessories. One additional element of importance in some cases is the excavation at the border of reservoirs to prevent shallow flowage and the growth and decay of vegetable matter which would occur when these slopes are alternately exposed and covered by the varying levels of water in the reservoir.

SETTLING RESERVOIRS, also known as *subsiding* and as *sedimentation* reservoirs, are shallow basins, with long weirs between the several compartments over which the water flows in thin sheets, thus drawing off only the upper and most clarified layer. (See WATER PURIFICATION.) It is desirable to make provision for removing the mud, to which end the paved bottoms may slope to a common point and then connect with a scour-pipe, through which the mud may be flushed with a stream of water from a hose.

DISTRIBUTING RESERVOIRS are generally located within or near the city which they serve. They are often classified as high, low, and middle service, according to their elevation and the areas which they supply. They may afford storage for periods ranging from a day or two up to several weeks; but in the latter case they would perform the duty of a storage reservoir as well. Occasionally distributing reservoirs are formed by a dam across a stream; but as a rule they have masonry walls above or below the natural surface. The construction of embankments or walls does not differ essentially from that of earth and masonry dams, except that when masonry is used the principles of design are more like those involved in the planning of earth retaining walls, subjected, of course, to water pressure on the other side at times; but also liable to be empty. It is common to line the inner slopes of reservoir embankments with stone, brick, concrete, or asphalt. The bottoms are frequently lined like the sides. When concrete is used it is well to lay it in relatively small squares, with a good filling for the joints, to prevent cracking.

COVERED RESERVOIRS may have vaulted roofs of masonry, generally either brick or concrete, or else less expensive and more temporary roofs of timber. Much ingenuity has been exercised to find a cheap and permanent covering, since the work at best adds largely to the cost of the structure. In fact, the cost is so great that covering is rarely attempted in the United States, except for relatively small reservoirs receiving either filtered water or that from underground sources, either of which is liable to injury through the development of organisms giving rise, in their life processes, to bad tastes and odors.

BIBLIOGRAPHY. Wegmann, *Design and Construction of Dams* (New York, 1899); Schuyler, *Reservoirs for Irrigation, Water Power and Domestic Supply* (New York, 1901); Frizzell, *Water Power* (New York, 1901); also general treatises on water-works by Fanning, Folwell, Goodell, and Turneure, and Wilson, *Manual of Irrigation Engineering* (New York, 1897).

DAMSEL FLY (so called from the French name *demoiselle*). An insect of the family Agrionidae, order Odonata, closely allied to the dragon-flies. They are, says Howard, the small, graceful species, with extremely slender bodies

and narrow, clear wings, held vertically in repose, which are very commonly found over large bodies of still, fresh water. "All of our North American species [about 75] are small, but in tropical regions they grow to a large size, and some South American forms are among the largest species of the order Odonata. They do not fly high in the air, but frequent low-growing aquatic vegetation. The colors as a rule are rather dull, but the slender bodies of some are brilliantly blue, green, or even red." Many authors unite with these as a subfamily the dark-colored, prominent-eyed flies otherwise regarded as constituting the separate family Calopterygidae. The life history of these flies is substantially that of the dragon-flies (q.v.). See Plate of DRAGON-FLIES.

DAMSEL OF BRIT'TANY. A title given to Eleanor of Brittany, sister of Arthur, Count of Brittany, and niece of King John of England, who confined her in the Castle of Bristol, where she died in 1241.

DAN (Heb., judge). A city on the northern boundary of Israel, called originally Laish (Judges xviii. 29), but renamed Dan by the Danite invaders. Owing to its northerly location (Gen. xiv. 14), it was often used in connection with Beersheba (I. Sam. iii. 20; II. Sam. iii. 10) in the phrase "from Dan to Beersheba," to express the whole land of Israel. The Danites introduced an idolatrous worship (Judges xviii.), but this gave way to the calf-worship introduced by Jeroboam (I. Kings xii. 29). At the solicitation of Asa, King of Judah, Ben Hadad, the Syrian King, invaded Israel, and, among other cities, Dan was destroyed (I. Kings xv. 20; II. Chron. xvi. 4). The ruins of the city are identified with modern Tel-el-Kadi.

DAN. The eponymous ancestor of the tribe of Dan, the son of Jacob and his concubine Bilhah (Gen. xxx. 5, 6). The tribe was one of the smallest and weakest of the Hebrew confederacy. Belonging to the northern group, its territory lay southwest of Ephraim, occupying the valleys of Sorek and Ajalon (Joshua xix. 40-46). Owing, however, to difficulties with the Amorites (Judges i. 34), we find them later migrating to the far north, and conquering the city of Laish, which they rebuilt and called Dan (Joshua xix. 47; Judges xviii.). Samson (q.v.) was of the tribe of Dan (Judges xiii. 2, 24, 25). The earliest reference to the tribe is in the song of Deborah (Judges v.); the passage in which Dan is reproached for seeking protection in ships, instead of coming forward to help its brother tribe Bilhah, is obscure; but it seems certain that at this period already Dan's settlements were to the north and near the seacoast. Dan, though designated as a 'concubine' tribe, which generally indicates secondary rank, plays no unimportant part in the early traditions and legends. This is in part due to the fame and antiquity of the sanctuary at Dan, which as late as the days of Amos is put on a level with Bethel and Beersheba (Amos viii. 14). In this sanctuary the older rites and practices were preserved with great fidelity, and its priests traced their origin to Moses himself (Judges xviii. 30). The name Dan ('judge') may originally have been the title of a deity.

DA'NA. CHARLES ANDERSON (1819-97). An American journalist, born at Hinsdale, N. H.,

August 8, 1819. He studied at Harvard, but, owing to defective eyesight, did not graduate. He joined the Brook Farm Association in 1841, edited in its interest *The Harbinger*, contributed to the *Boston Chronotype*, and, after the failure of Brook Farm, was, with its founder, Ripley (q.v.), connected with the *New York Tribune* (1847-62). Disagreement with Horace Greeley in war politics, proclaimed in a once-famous editorial, "On to Richmond," forced his resignation. He was Assistant Secretary of War in 1863-64. After the war he edited the *Chicago Republican*, which failed. He then returned to New York and became part proprietor and editor-in-chief of the *New York Sun*—a position which he held from 1868 to his death. With George Ripley he planned and edited the *New American Cyclopadia* (1857-63), and its successor, the *American Cyclopadia* (1873-76). He compiled also the well-known *Houschold Book of Poetry* (1857), and collaborated in a *Life of Grant* (1868). Other works are: *The Art of Newspaper Making* (1895); *Lincoln and His Cabinet* (1896); and *Recollections* (1897). At the time of his death at Glen Cove, L. I., on October 17, 1897, Mr. Dana was in many ways the most noted journalist in the country. He had a brilliant intellect and understood every detail of the art of making a good newspaper, but he was generally believed to be so intense in his prejudices that he failed to acquire the authority to which his talents entitled him.

DANA, CHARLES LOOMIS (1852—). An American neurologist. He was born at Woodstock, Vt., and was educated at Dartmouth College and the New York College of Physicians and Surgeons. He served as professor of physiology in the New York Woman's Medical College, of nervous and mental diseases at the New York Postgraduate Medical School, and of nervous diseases in Dartmouth Medical College, and for a time was president of the American Neurological Association. Besides numerous papers, his publications include a *Text-book of Nervous Diseases* (1892).

DANA, EDWARD SALISBURY (1849—). An American mineralogist, born at New Haven, Conn. He graduated at Yale University in 1870, and became tutor there in 1874. He received his doctor's degree at Yale in 1876, and also studied at Heidelberg and Vienna. In 1879 he was made assistant professor of natural philosophy and astronomy, and later professor of physics, at Yale. His publications include numerous papers on mineralogical topics: "Appendix I." and "Appendix II." of Dana's *System of Mineralogy*; a *Text-Book of Mineralogy* (1877); *Minerals and How to Study Them*, and a *Text-book of Mechanics* (1881).

DANA, FRANCIS (1743-1811). An American statesman and jurist. He was born in Charlestown, Mass.; graduated at Harvard in 1762; soon became prominent at the bar, and, as a Whig, in colonial politics; and from 1776 to 1780 was a member of the Executive Council of Massachusetts. He was elected to the Continental Congress in 1776, and from the first took a conspicuous part in the work of that body. In 1778 he was made chairman of a committee appointed to draw up plans for the reorganization of the army, and in the same year was a member of the committee of three to which the

conciliatory proposals of Lord North were referred. He went abroad in September, 1779, as the official secretary of John Adams, recently appointed to negotiate a treaty of peace with Great Britain, and, after spending some time in Paris and Amsterdam, was sent in March, 1781, as United States Minister to the Court of Saint Petersburg. Catharine persistently refused to receive him as an accredited Minister, however, and in 1783 he returned to America. He was again elected to the Continental Congress (1784), and in January, 1785, was appointed Justice of the Supreme Court of Massachusetts. In 1786 he was a delegate to the Annapolis Convention (q.v.), and in the following year was also elected as a delegate to the Constitutional Convention at Philadelphia, but was prevented by illness from attending. In the State Convention of 1788 he cooperated with Theophilus Parsons and John Hancock in securing the ratification of the Federal Constitution by Massachusetts. He was Chief Justice of the Massachusetts Supreme Court from 1791 to 1806, during which period he took no active part in State or national politics.

DANA, JAMES DWIGHT (1813-95). An American geologist and one of the eminent scientists of the last century. He was born in Utica, N. Y. His father was a successful business man of New England birth, and his mother was Harriet Dwight, daughter of Seth Dwight, of Williamsburg, Mass. Dana early became interested in scientific studies. In his school days at Utica he devoted much time to chemical investigations, and he frequently made excursions to distant points for the purpose of collecting minerals. Attracted by the reputation of Professor Silliman, he entered Yale College in 1830, where for three years he pursued the study of classics, mathematics, and natural sciences. In 1833 Dana received an appointment as instructor in the United States Navy, a position that afforded him an opportunity of European travel. Three years afterwards he returned to Yale and was appointed assistant to Professor Silliman. While at New Haven he published his first important scientific work (*The System of Mineralogy*), a book that subsequently passed through several editions and attained a reputation in both Europe and America as a standard of reference. From 1838 to 1842 Dana was a member of the Wilkes Exploring Expedition sent out by the United States Government. While on this expedition, which explored the little known parts of the Pacific Ocean, he had a wide field for scientific discovery and description. The opportunities presented were such as few scientists have received; so extensive was the material collected that, upon his return to the United States, Dana devoted thirteen years of almost constant labor to its study. The results were published by the Government in three voluminous reports: "Zoöphytes," in *United States Exploring Expedition* (Philadelphia, 1846); "Geology," in *United States Exploring Expedition Under C. Wilkes, U. S. N.* (Philadelphia, 1849); and "Crustacea," in *United States Exploring Expedition Under C. Wilkes, U. S. N.* (New York, 1852-54). In the work on "Zoöphytes," 230 species were described by Dana for the first time, while the report on "Crustacea" contained descriptions of no less than 658 new species. The intense zeal with which Dana pursued this task seriously

impaired his health, and although he was able to accomplish much in after-years, his life henceforth was a continual struggle against disability.

The value of Dana's services to science received prompt recognition from Yale College, which appointed him in 1850 to the professorship of natural history, a position he filled from 1855 to 1890. During this period his activities found expression in lectures to college students, in several text-books on geology and mineralogy, and in numerous contributions to scientific journals. His work was characterized by keenness of perception, great powers of analysis, and by vivid imagination. These qualities eminently fitted him for geological investigations, and his discussions of the grander features of the earth, such as the form and origin of continents, mountain-building, and volcanoes, are among the most valuable contributions to scientific literature. From 1846 until his death he served almost continuously as editor of the *American Journal of Science*, in which many of his papers were published. Dana received many marks of honor from American and foreign institutions. He was elected president of the American Association for the Advancement of Science in 1854, and at various times a member of the Royal Society of London, the Institute of France, and the Royal Academy of Berlin, the Royal Academy of Vienna, and of many other learned societies. In 1872 the Geological Society of London conferred upon him the Wollaston Medal "in acknowledgment of his services to mineralogy and geology," and in 1877 he received the Copley Medal "for his biological, geological, and mineralogical investigations, carried on through half a century, and for the valuable works in which his conclusions and discoveries have been published." The more important of his contributions to scientific literature, in book form, are the reports previously mentioned, and the following: *A System of Mineralogy* (1837; 4th ed. 1854); *Manual of Mineralogy* (1848; 4th ed. 1854); *Manual of Geology* (1862; 4th ed. 1865); *Coral and Coral Islands* (1872; 2d ed. 1890); *Text-Book of Geology* (1864; 4th ed. 1882); *The Geological Story Briefly Told* (1875). He died in New Haven, April 13, 1895.

DANA, NAPOLEON JACKSON TECUMSEH (1822—). An American soldier, born in Eastport, Maine. He graduated at West Point and was assigned as second lieutenant of infantry in 1842. During the Mexican War he served in both the northern and the southern campaigns, and in April, 1847, was brevetted captain for gallantry at Cerro Gordo, where he was severely wounded. In 1855 he resigned and thereafter until 1861 was engaged in the banking business in Saint Paul, Minn. On the outbreak of the Civil War he entered the service as colonel of a regiment of Minnesota volunteers, and in February, 1862, was appointed brigadier-general of United States volunteers. He served throughout the Peninsular and Maryland campaigns; was seriously wounded at Antietam; became a major-general of volunteers in November, 1862; was engaged in various operations in the Department of the Gulf, and then commanded successively the District of Vicksburg, the Sixteenth Army Corps, the Districts of West Virginia and Vicksburg, and the Department of the Mississippi. In May, 1865, he resigned from the service, and subsequently took an active interest in railway man-

agement, becoming president of the Montana and Union Railway Company in 1885. He was appointed captain and assistant quartermaster U. S. A., by special act of Congress, and retired from active service in 1894.

DANA, RICHARD (1700-72). An American jurist. He was born in Cambridge, Mass., graduated at Harvard in 1718, and soon became one of the leaders of the Massachusetts bar. He was also prominent, as a Whig, in colonial politics; frequently presided over Boston town-meetings; was chosen to administer the oath to Andrew Oliver binding him not to carry out the provisions of the Stamp Act, and in 1770 was a member of the committee appointed to make a careful investigation of the Boston Massacre.

DANA, RICHARD HENRY (1787-1879). An American poet, essayist, and novelist, born in Cambridge, Mass., November 15, 1787. He entered Harvard College in 1804, but remained there only three years. Adopting law as a profession, he was admitted to the Boston bar in 1811, but after some activity in politics renounced the practice of law for literature. His first literary work of note was an oration delivered on July 4, 1814, before the Washington Benevolent Society in Cambridge. In 1815 he became associated with the *North American Review*, to which he contributed several essays, and of which he was for a time an editor. He then (1821) started a miscellany, *The Idle Man*, to which his friend Bryant contributed, but which came to an end after the sixth number had been issued. His published works are: *Poems* (1827); *Thoughts on the Soul* (1829), a poem delivered before the Porter Rhetorical Society of Andover, Mass.; *Poems and Prose Writings* (1833), the best of which were republished in *The Buccaneer and Other Poems* (London, 1844); and *Poems and Prose Writings* (2 vols., 1850). He did his best work as a critic, and had considerable influence in forming the taste of New England in the early part of the century. His poetry was good for the time, but is read little to-day. "The Buccaneer" is probably his best poem; his prose tales, such as "Paul Felton," display imagination but are poorly constructed.

DANA, RICHARD HENRY (1815-82). An American author, born in Cambridge, Mass., a son of Richard Henry Dana, the poet. He developed in early life a passion for the sea, and was with difficulty restrained from entering the navy. He entered Harvard, but suffered from weak eyes, and, to cure them, undertook a Pacific voyage as a common sailor, a record of which is given in his sea-classic *Two Years Before the Mast* (1840; augmented ed. 1869), a book often republished and translated. On his return Dana reentered Harvard and graduated in 1837. He studied law and attained eminence in practice. On sea usages and laws, he wrote *The Seaman's Friend* (1841), reprinted in England as *The Seaman's Manual*. He contributed to legal journals and to the *North American Review*; wrote *To Cuba and Back* (1859); and edited *Wheaton's International Law* (1866). In 1876 he was appointed Minister to England, but was refused confirmation through a paltry political intrigue and unfounded accusations of plagiarism. He richly deserved the honor because of his patriotism, his high character, and his diplomatic

and legal learning. To prosecute studies on international law he went to Europe in 1878. He died in Rome of pneumonia. Consult Adams, *Richard Henry Dana: A Biography* (1890).

DANA, SAMUEL LUTHER (1795-1868). An American chemist. While chemist of the Merrimack print-works he invented a method of bleaching cotton goods which was widely adopted, and discovered that sodium phosphate is a mordant, a fact of considerable importance in the art of calico-printing.

DANA, WILLIAM PARSONS (1833—). An American artist, born in Boston. He studied art in Paris under Picot and Le Poitevin, and became known as a marine and genre painter. He was made a member of the National Academy in 1863, and in 1878 won a third-class medal at the Paris Exposition for his picture "Gathering Seaweed" (1878). Other of his works are: "Chase of the Frigate Constitution," and "Heartsease."

DANAË, dān'ā-ē (Lat., from Gk. *Δανάη*). The daughter of Acrisius, King of Argos. According to the legend, an oracle declared that her son would kill his grandfather. Acrisius therefore confined Danaë in an underground chamber, or in a tower of bronze. Here she was visited by Zeus in a shower of gold, and bore him Perseus (q.v.). Acrisius put both the mother and child into a chest, and exposed them on the sea. The chest, however, drifted ashore on the island of Seriphos, and Danaë and her child were saved. Danaë remained in the island until Perseus had grown up and become a hero famous for his exploits. She afterwards accompanied him to Argos. On his approach Acrisius fled, but was subsequently slain accidentally by Perseus at Larissa. Rembrandt, Correggio, and Titian have made the picturesque union of Danaë and Zeus the subject of famous paintings, which hang respectively in the Hermitage at Saint Petersburg, the Palazzo Borghese at Rome, and the Museo Nazionale at Naples. A second Titian on the same myth is in the Imperial Gallery, Vienna.

DANÆ'US, or DANEAU, dā'nō'. LAMBERT (c.1530-95). A French Reformed theologian. He was born at Beaugency; studied law at Orléans, Paris, and Bourges; became a Protestant in 1560; was preacher in France (1561-72); fled to Geneva on the outbreak of the Saint Bartholomew massacres (August 24, 1572), and preached in various other places till his death at Castres, November 11, 1595. He was one of the most important Reformed theologians of the sixteenth century, and the author of many learned volumes, the most famous of which is his *Ethica Christiana* (1577; 7th ed. 1640), the first Protestant attempt at a system of morals apart from dogmatics. For his life, consult Paul de Félice (Paris, 1882).

DANAI, dān'ā-ī, or DANAŌI, dān'ā-oi (Lat., from Gk. *Δαναοί, Danaoi*). A term originally applied to the Argives as the descendants of King Danaüs. Because of their warlike character. Homer uses the name to designate the Greeks in general.

DANAIDE, dān'ā-īd (from Lat. *Danaides*, Gk. *Δαναίδες*, the fifty daughters of Danaüs, condemned, with one exception, to pour water eternally into sieves as a punishment for mur-

dering their husbands on their wedding night at their father's bidding). An early form of water-wheel, sometimes called a tub-wheel. It resembled a smaller tub set in a larger one, with a free annular space and with a horizontal space between the two bottoms provided with radial floats, arranged spirally. The whole device revolved on a vertical axis, water flowing through it vertically.

DANAÏS, dān'ā-īs (Neo-Lat., from Gk. *Δανάϊς*, daughter of Danaüs). A genus of large blue- and brown-winged, strongly marked nymphalid butterflies of the tropics, of especial interest to the students of mimicry and protective coloration. According to Bates and Wallace certain South American species are distasteful to the local birds, monkeys, and other butterfly-hunters, and therefore fly about regardless of exposure; and they are 'mimicked' by other butterflies, which are eatable, in order to secure immunity through this gradually acquired resemblance. (See MIMICRY.) An Australian species is the bugong 'moth,' whose grub the aborigines regard as a dainty. (See BUGONG.) The representative of the group in the United States is the familiar milkweed-butterfly, formerly classified as *Danais archippus*. See MILKWEED-BUTTERFLY.

DANAKIL, dā'nā'kil. An Ethiopian people, calling themselves Afar. See also AFRICA, *Ethnology*.

DANAŌ, dā-nā'ō. A town of Cebú, Philippines, situated four miles north of Cebú, on the coast, near the mouth of the Danao River. The town is very old, having existed from the time of the conquest. Population, in 1898, 15,483.

DANAÛS, dān'ā-ūs (Lat., from Gk. *Δαναός*). A mythical personage, according to the common genealogy, the son of Belus and Anchinoë, grandson of Poseidon, brother of Ægyptus, and originally ruler of Libya. Thinking his life in danger from the machinations of his brother, he fled to Argos, accompanied by his fifty daughters, known as the Danaides, where he was chosen king, after the banishment of Gelanor, the last of the Inachidæ. The fifty sons of Ægyptus followed him, and sought the hands of his daughters in marriage. Danaüs consented, but in fear of treachery or in revenge for his exile, gave each of his daughters a dagger, and made them promise to murder their husbands on their wedding night. All did so, except Hypermetra, who saved her husband, Lynceus. The future of the Danaides was variously told. According to one version, Danaüs found no suitors for his daughters, and finally offered them as prizes in a contest. They were thus married to the Argive youth and became the ancestors of the Danai. The story of Lynceus was also variously told; according to one version Hypermetra was forgiven, and Lynceus chosen by Danaüs as his successor. The other version was that Lynceus later slew Danaüs and his guilty daughters. The Danaides in the lower world were condemned to the never-ending task of filling with water a vessel full of holes. The Danaides seem to have been regarded as nymphs of the springs in the plain of Argos, and Danaüs is said to have been the first to dig wells for the inhabitants, who thereupon chose him king. The tomb of Danaüs, in the Agora of Argos, was shown as late as the time of Pausanias.

DANBURY. A city and one of the county-seats of Fairfield County, Conn., 60 miles north-northeast of New York City: on the Berkshire and Highland divisions of the New York, New Haven and Hartford Railroad (Map: Connecticut, B 4). It contains a court-house, the county jail, a public library, parks, a beautiful cemetery, two soldiers' monuments, and one to General Wooster. An annual agricultural fair is held here. The manufacture of hats, dating from 1780, represents a capital of about \$3,000,000. Other products are machinery for making hats and cutting fur, paper and wooden boxes, shirts, silk, and silver-plated ware. The government, under a charter of 1889, is vested in a mayor, biennially elected, and a city council, which confirms the mayor's nominations to the police department and elects all other administrative officials. The water-works are owned and operated by the municipality. Population, in 1890, 16,552; 1900, 16,537.

First settled in 1684, Danbury was organized as a town in 1687, was incorporated as a borough in 1822, and was chartered as a city in 1889. Supplies for the American army were stored here during the Revolution, and in April, 1777, General Tryon entered the town, destroyed the stores, and burned a large number of the buildings. An American force pursued, and, in a skirmish at Ridgefield, General Wooster (q.v.) was mortally wounded. Consult Bailey, *History of Danbury, 1684-1896* (New York, 1896.)

DANBY, FRANCIS (1793-1861). An Irish painter, born near Wexford, November 16, 1793. He entered the Royal Dublin Society's school, and also studied under O'Connor. In 1812 he exhibited his first picture, "Landscape—Evening," in Dublin. In 1813 he visited London, but shortly left there and went to Bristol, where he lived until 1824, supporting himself by giving lessons in drawing. In 1824 he made his reputation by a large marine painting, "Sunset at Sea, After a Storm;" and his "Opening of the Sixth Seal," in 1828, at the Institution, secured his election to the Royal Academy. In the same year he removed to London. The following year he sent two pictures, subjects from the Revelation, to the Academy: but, on account of a quarrel with the authorities, he went to live in Switzerland, where he remained eleven years. He returned to London in 1841, and from that year exhibited annually both at the Academy and at the Institution. "The Evening Gun," exhibited in 1848, is one of his finest works. He died at Exmouth, February 10, 1861. His art showed high imagination, with the effect of solemnity and stillness, but his composition was often theatrical and his execution smooth and thin. His son, JAMES FRANCIS DANBY, was a landscape painter of some repute.

DANBY, THOMAS OSBORNE, Earl of (1631-1712). An English statesman. In 1673 he was appointed Lord High Treasurer, and in 1674 was created first Earl of Danby. On the resignation of Clifford in 1673, he became Lord High Treasurer and Prime Minister of the Kingdom, and retained these positions until 1678, when he was accused of carrying on treasonable negotiations with France, and imprisoned in the Tower, with some interruptions, for five years. The marriage of Mary, daughter of the Duke of York, to William of Orange was due mainly to his per-

sistent efforts, and upon the accession of William III. in 1689 he became President of the Council. He was created Duke of Leeds in 1694, but was impeached for bribery in the following year. The charge, however, was not pressed.

DANCE, GEORGE, JR. (? 1740-1825). An English architect, born in London. He was associated with his brother Nathaniel in the foundation of the Royal Academy, of whose original members he was for several years the last survivor. Newgate Prison was rebuilt in 1770 from his plans, and the front of the Guildhall was also designed by him. In later life he exhibited chalk portraits.

DANCE OF DEATH. See DEATH, DANCE OF.

DANCETTE, dän-sët' (Fr., irregular formation from Lat. *dens*, tooth). One of the lines of partition in heraldry, which differs from indented (q.v.) only in the greater size of the notches. The indentations where the division is *per fess dancette* never exceed three in number.

DANCING (from *dance*, from OF. *dancer*, *danser*, Fr. *danser*, to dance, from OHG. *dansōn*, to drag, from *dinsan*, OS. *thinsan*, to drag; connected with Lat. *tenus*, cord. Gk. *τελευν*, *teinein*, Lith. *tensti*, Skt. *tan*, to stretch). The origin of dancing may be traced to a universal desire of expressing emotion by action. At a later period comes the element of pantomime, the suggestion of an *idea* by means of motions. As far into antiquity as history reaches, every dance, whether belonging to civilized or to savage nations, was accompanied by music, or by rhythmic beats on the drum, shells, rattle, sticks, or by clapping of hands. Frequently the dance was accompanied by chants or songs. Records show in a general way that in the very earliest times people danced and sang at the same time; afterwards some danced while others sang an accompaniment, and finally musical instruments took the place of voice accompaniment. Ultimately music and the dance separated, the former improving and the latter deteriorating.

A consideration of savage dances as we find them at present (and it is remarkable how world-wide are the principal forms) will give us a general idea of dancing before the beginnings of civilization. Folk-dancing may be divided into three groups—*social*, *warlike*, and *religious*. Under the first may be included all comic and erotic dances. Under the second we have those dances which were used to inspire the warriors before a battle, to celebrate a victory, or to imitate the motions of animals after a successful hunt. The *religious* class comprises medicine, incantation, and mystery dances. Although this general classification does not by any means exhaust the list of savage dances, it will be found that all others are derivative, or of merely local importance. In all forms of savage dancing exactness is insisted upon. Each dance has its particular step, and among certain tribes mistakes on the part of the performer are often punished by death. This insistence on absolute precision is characteristic of their idea of dancing. It is a serious business, and even in comic dances the performer maintains an air of absolute gravity. It is of interest to note that their dances are most numerous during the summer and winter solstices, and at such times the figures danced are almost always circular. The separate forms of savage dances are too numer-

ous to describe, but of greatest importance are the religious ones. A universal custom is the dancing of women while the men are away at war. It is a sort of prayer, for they continue it day and night, believing that by so doing they protect the warriors from evil spirits and from danger. The medicine dances have two purposes—one to ward off harmful influences; the other, strange as it seems, to keep the patient awake. This latter motive is explained by the belief of savages that when a man is asleep his soul temporarily leaves his body. When he dies the departure of his soul is final; if, then, the sick man falls asleep, his soul may take advantage of the opportunity to go away and not return; and consequently the most heroic measures are employed to keep him awake. In the savage mysteries, as in the Greek, dancing plays an important part; but so great and universal is the secrecy maintained about them that we know practically nothing of the elaborate dances used. One of the most sacred rites is the initiation of a lad to manhood. Sword, snake, and fire dances are especially developed among the American Indians.

ANCIENT DANCES. In Egypt dancing reached a state of considerable excellence, for although Egyptian dances were monotonous and unimaginative, like those of most Oriental peoples, the use of the body and of the hands and arms was carried to great perfection. Their most important dances—those in honor of the dead—were slow and gliding, but they had also many lively forms. The *pirouette* in particular was developed in Egypt about 4000 years ago. As dancing was never, at least in the early and middle empires, practiced by the higher classes, its cultivation was carried on wholly from the religious and spectacular standpoints; and thus the social element, which more than any other has helped the art of dancing, was never given any prominence. See EGYPTIAN MUSIC.

Hebrew dancing was essentially a religious rite. It was an act of praise, and no religious festival or feast was complete without dances. Miriam, leading out the women in a dance, is typical of a form used in Arabia to-day. It should be noticed that each sex danced by itself, and that, in this particular, Hebrew dancing differed from its Egyptian prototype. See HEBREW MUSIC.

When we come to Greece we approach the golden age of the art of dancing. Here for the first time it ranked with poetry and music, and, as Lucian expresses it, dancing and music were 'the married pair.' Heretofore dancing had represented emotions; now it was also made to represent ideas, and pantomime arose. Hands and arms were used still more than legs; but an atmosphere of gaiety and expressiveness foreign to Oriental nations was created. The Greeks were a cheerful religious nation whose sense of dignity did not interfere with their dancing, as it did in the case of the Romans; and as long as their morality remained unshaken the dance retained its purity. It was at first religious, then educational, and finally popular. There were four great classes of sacred dances—the *Emmeleia*, the *Hyporchema*, the *Gymnopaedia*, and the *Endymatia*. From these four types the later forms were derived. The characteristics of the first were its gentle gravity, strength, and nobility. It was danced without the support of

either a chorus or a voice. The second class was danced by both men and women, and was of a dignified, elevated character. The *Gymnopaedia* was a favorite of the Lacedaemonians in the festivals of Apollo. It was danced by youths, and was often a preliminary to the wild Pyrrhic dance. In the last, the *Endymatia*, the performers wore most brilliant clothes, and this first of all the sacred dances lost its sacred character and became merely a popular dance. The military dances came later, and were principally educational. They were divided into two groups: (a) Pyrrhic, and (b) Memphitic. The first was really a military pantomime, and was used especially at festivals in honor of Minerva. It was danced by both men and women, was wild and rapid, and finally degenerated into the rites of Bacchus. The Memphitic was less warlike and wild, but its general character was the same. On the Greek stage there were tragic, comic, and satiric dances. The costumes and scenic arrangements were often elaborate, and the evolutions were accompanied by choral song. The forms were multitudinous, and the performers became so adept in the expression of emotions that the sculptors and painters of Greece selected them as their models. Although the pantomime was introduced first in Greece, it never reached the height of perfection which characterized it among the Romans.

Rome had few native dances. The *Bellicreps* was a war dance said to have been invented by Romulus. The Salian dance was the original of many later forms, and was danced by the priests of Mars. Later the Romans adopted some forms from Etruria, and still others from Greece. One of the most interesting of their dances was the May-day dance, which corresponded to the flower dance of the Greeks. It is really the original of the old English May-day sports, for, as in England, the youths and maidens danced out into the fields, gathering flowers and branches, and returning to the city again to continue their dancing. Upon the deterioration of Greek power, Rome inherited its arts, and among them its dances, which were modified and increased. In the reign of Augustus the dance was introduced into the theatre. It became widely popular, there being at the time about three thousand foreign women dancers in Rome. At this time pantomime had reached its height, fable, history, poetry all being perfectly expressed in mute action. The most cultured persons studied the art; but under Nero and his successors the decline began, and dancing became exaggerated and licentious.

EARLY AND MEDIEVAL DANCES. After the fall of Rome, dancing as an art practically disappeared. Christianity at first encouraged it as an inheritance from the Jews; Saint Basil recommended the practice of the dance on earth because it was the principal occupation of the angels in heaven, and sacred dances were given on feast days, and later every Sunday. In reality they were hardly so much dances as processions, each sex going through the evolutions separately. Gradually, however, they degenerated from their solemn character, and in 692 were expressly forbidden by the Church, though they still lingered in some localities for a considerable length of time. There are curious survivals of these old Church dances, such as *Los Seises* (q.v.), which is still performed annually by the choir boys

in the cathedral at Seville, on Corpus Christi and the Immaculate Conception: the *Gaillia di San Paolino* is a ritual dance performed on June 26, in front of the Cathedral of Nola, near Naples, in honor of San Paolino, who, on his return from Barbary, was met by a procession of the citizens of Nola. Meanwhile the simpler forms of the dance had been preserved by the peasants of Gaul, who kept them alive until they were taken up by the knights and nobles. In Spain the heritage of dances left by the Romans was more or less imperfectly preserved. Even the Arab invasion could not completely destroy the old forms; and there are some dances used at present in Spain, such as the *Turdion* and *Gibiduna*, which date from about the twelfth century. Liveliness is characteristic of early as well as later Spanish dances.

Dancing in Germany and England developed along the lines originated by the barbaric nations which governed their early history. In England the egg dance and the *Carole* were derived from Saxon sources. The Morris dance was introduced in the reign of Edward III. All English dances are lively and varied in motion. In Germany, war, funeral, and harvest dances were among the earliest popular kind, and with the formation of the guilds each trade adopted its characteristic dance. Hans Sachs gives an excellent description of the Schönpart, which was a carnival dance peculiar to the city of Nuremberg. From the thirteenth century on, each class of society had its own dances; but there were two general classes—the 'circular dance' and 'the measure.' The first was a rapid, uneven sort of dance; the second, a slow, gliding movement.

MODERN DANCES. The revival of dancing as an art began in Italy in the fifteenth century. The Renaissance awoke an interest in dancing as well as in the other arts, and ballets were given on an elaborate scale. Catherine de' Medici introduced the fashion into France, and from that time on France has led the world in the refinement of its dances and the gracefulness of its performers. It borrowed dance forms from almost every civilized country, but so adapted and changed them that their value was immeasurably increased. The origin of modern French forms may be traced to the *danses basses* and the *danses hautes* of the sixteenth century. The former were so called because of their slow, even motion; they were practiced by the nobility. The *danses hautes* were lively, jumping dances, and were performed only by the country people and the lower classes. Later the *galliard*, *courante*, and *volta*, which were of a more lively character than the old Court dances, were introduced; and still later the *branle* became popular. It was a dance of exceedingly varied character, each province having its own form, the *passepied* of Bretagne and the *minuet* of Poitou being branles. Richelieu gave many famous ballets during the reign of Louis XIII., while Louis XIV. was himself an enthusiast of the dance, founding in 1661 the Academy of the Dance. In the seventeenth century many of these Court dances were enjoyed for the sake of the music alone, and the idea arose of playing several of them in succession as a merely instrumental entertainment. Out of this custom originated the *suite* (q.v.), which in its turn suggested the *sonata* (q.v.) and the *symphony* (q.v.). The *snites* of Bach, Handel,

and Corelli contain excellent examples of some of these old dances. In Italy these groups of dances were early known as *Sonate da Camera*. As the classic composers used these old dance forms, so modern composers have utilized more recent dances in their compositions. Thus the *esárdás* is found in Liszt's *Hungarian Rhapsodies*; the *seguidilla* in Bizet's *Carmen*; and there is a charming series of Spanish dances in Massenet's *Le Cid*. The list of national dances is large, but the most representative are the *fandango* and *bolero* of Spain; the *tarantella*, the *saltarello*, and the *forlana* of Italy; the *mazurka* and the *polonaise* of Poland; the *reel* and the *Highland fling* of Scotland; and the *jig* in Ireland and Wales. Numerous classes of national dancers have arisen, of which the Bayederes or Nautch girls in India and the Geishas in Japan are well-known examples. In all the Eastern countries the dance is really a sort of pantomime containing a series of gestures, postures, and mimeries.

Of the more popular modern dances, the *quadrille* is probably the oldest. Its recent development dates from 1815; but before that time it was common in Europe for centuries. The *lancers* was invented in 1836; the *polka* was introduced about 1835; and the *waltz*, from Germany, about 1812. The *two-step* is of American origin, and has lately become exceedingly popular. For a discussion of the development of the *ballet*, see that article. There is no authoritative and comprehensive history of dancing, but the best works are: Grove, and collaborators, *Dancing* (London, 1895); Vuillier, *A History of Dancing*, translated from the French (New York, 1897); Giraudet, *Traité de la danse* (Paris 1900), which gives exact descriptions of a great number of dances; Cahusac, *La danse ancienne et moderne* (La Hague, 1754), which, although completely out of date, contains much of historical value; and Emmanuel, *La danse grecque antique, d'après les monuments figurés* (Paris, 1896). See also ALLEMANDE; BOLERO; CACHUCHA; CANARIE; CANCAN; CARMAGNOLE; CHACONNE; COTILLON; CUSHION DANCE; CSÁRBDÁS; EGG DANCE; FANDANGO; FARANDOLE; FIRE DANCES; FLOWER DANCE; GALOP; GAVOTTE; GEISHA; HIGHLAND FLING; HORMOS; HORNPIPE; JIG; JOTA; KIRMESS; LANCERS; MAY DANCE; MAZURKA; MEDICINE DANCES; MINUET; MORRIS DANCE; NAUTCH GIRLS; PASSEPIED; PAVANE; POLKA; POLONAISE; QUADRILLE; REDOWA; REEL; RIGADON; SALMON DANCE; SARABANDE; SCHOTTISCHE; SEGUIDILLA; SICILIANA; COVERLEY, SIR ROGER DE; SNAKE DANCES; SUN DANCES; SKIRT DANCES; STRATHSPEY; SWORD DANCES; TAMBOURIN; TARANTELLA; TARASQUE, LA; TORCH DANCE; WALTZ.

DANCING FAUN. An antique bronze representing a faun dancing and snapping his fingers to mark the time. It was discovered in 1853 in a house in Pompeii, hence known as the House of the Faun.

DANCING GIRLS. A designation applied to various classes of women, especially in India, whose profession is to dance and sing in connection with the temples, and in services upon the idol of some god. They also perform at entertainments of private persons or nobles. A number of subdivisions or classes of these dancers

are recognized in India. Consult Whitworth, *Anglo-Indian Dictionary* (London, 1885). See BAYADERE; NAUTCH.

DANCING MANIA. A form of epidemic disorder allied to hysteria (q.v.), and evidently the result of imitative emotions acting upon susceptible subjects, under the influence of a craving for sympathy or notoriety. There is little doubt that imposture entered to a considerable extent into all the epidemic forms of the dancing mania, which indeed were usually attended by consequences that showed clearly the presence of impure motives; but there is also evidence that in many cases the convulsive movements were really beyond the control of the will, whatever may have been the original character of the motives that prompted them. Epidemics of this sort were common in Germany during the Middle Ages; in Italy, a somewhat similar disease was ascribed to the bite of a spider called the tarantula (see TARANTISM); and similar convulsive affections have been witnessed in Abyssinia, India, and even in comparatively modern times and in the most civilized countries in Europe, under the influence of strong popular excitement, especially connected with religious demonstrations. The true dancing mania of the Middle Ages, however, prevailed chiefly in the crowded cities of Germany.

In July, 1374, there appeared at Aix-la-Chapelle assemblies of men and women, who began to dance on the streets, screaming and foaming like persons possessed. The attacks of this mania were various in form, according to mental, local, or religious conditions. The dancers, losing all control over their movements, continued whirling in wild delirium till they fell in extreme exhaustion, and groaned as in the agonies of death; some dashed out their brains against walls. When dancing, they were insensible to external impressions, but were haunted by visions, such as of being immersed in a sea of blood, which obliged them to leap high, or of seeing the heavens open, and the Saviour enthroned with the Virgin Mary. The frenzy spread over many of the towns of the Low Countries. Troops of dancers, inflamed by intoxicating music, and followed by crowds, who caught the mental infection, went from place to place, taking possession of the religious houses, and pouring out imprecations against the priests. The mania spread to Cologne, Metz, and Strassburg, giving rise to many disorders and impostures and much profligacy. Exorcism had been found an efficacious remedy at the commencement of the outbreak; and in the beginning of the sixteenth century Paracelsus, that great reformer of medicine, applied immersion in cold water with great success. At the beginning of the seventeenth century the Saint Vitus's dance, as the affection was called (see CHOREA), was already on the decline; and it now occurs only in single cases as a sort of nervous affection. For a detailed account of the phenomenon, consult Hecker, *The Dancing Mania of the Middle Ages* (3d ed., London, 1859).

DANCLA, dān'klā', JEAN BAPTISTE CHARLES (1818—). A French violinist and composer. He studied under Baillot, Halévy, and Berton, and gained many prizes for his proficiency. In 1857 he was appointed professor of the violin at the Paris Conservatory and had many eminently

successful pupils. He was famous for his execution and tone as a player, as much as for his many successful compositions, notably his *Études*, and exercises for the violin.

D'ANCONA, dān-kō'nā, ALESSANDRO (1835—). An Italian literary historian, born at Pisa. He was educated in Florence, and in 1860 became professor of literature in the University of Pisa. His works consist of valuable studies in early Italian literature, a field little known until his time. He edited various texts with critical notes and prefaces, including stories, legends, curious traditions, and notably an edition of the *Vita Nuova* (2d ed. 1884). His other writings include: *Opere di Tommaso Campanella, scelte, ordinate ed annotate* (1854); *Suere rappresentazioni del secolo XIV., XV. e XVI.* (1872), and *Origini del teatro in Italia* (1887).

DANCOURT, dān'kōōr' FLORENT CARTON (1661-1725). A French dramatist and actor. He was born at Fontainebleau, November 1, 1661, and was educated by the Jesuits. He practiced law for a time, but after marrying an actress took to the stage and in 1685 appeared as an actor at the Théâtre Français with popular success and royal favor. In that year his first play, *Le notaire obligeant*, won applause. It was followed by many others, of which *Le chevalier à la mode* (1687) is his best, if indeed it be his, which is doubtful. In 1718 he retired from Paris and the stage, and occupied his declining years with a metrical version of the *Psalms*, and a sacred tragedy. He died at Courcelles (Indre et Loire), December 6, 1725. His rather farcical comedies are best when dealing with middle and low life and the peasantry. They are easy and witty in dialogue, realistic in treatment, and not infrequently introduce events and persons of passing notoriety. Dancourt's *Works* were collected in 12 volumes (1760), his select *Works* in five volumes (1810). Consult Lemaître, *La comédie après Molière et le théâtre de Dancourt* (Paris, 1882).

D'ANCRE, dān'kr'. See ANCRE.

DANDELION (Fr. *dent de lion*, tooth of a lion, referring to the teeth on the leaves), *Taraxacum officinale*. A stemless perennial or biennial plant of the natural order Composite, native to Europe and Asia, and now common in all temperate countries. The dandelion is used to a considerable extent both in England and the United States for greens and the blanched leaves for salads. Several improved varieties, mostly of French origin, are in cultivation. The root is employed in medicine and is sometimes ground and used to adulterate coffee. The plant called the fall dandelion is *Leontodon autumnalis*. For illustration, see SALAD PLANTS.

DAN'DIE DIN'MONT. See TERRIER.

DANDIN, dān'dēn. A Sanskrit author who is believed to have flourished in the latter part of the sixth century A.D. He composed a well-known Sanskrit novel or series of stories, entitled *Daśa-kumāra-carita*, or *Adventures of the Ten Princes*, a sort of romance of roguery. He is also the author of a valuable rhetorical treatise entitled *Kāvya-lōka*, or *Mirror of Poetry*, and some scholars, like Pischel, have sought to ascribe the Sanskrit play *Mrecha-katikā* (q.v.) to his pen. Dandin was probably the earliest

of the Sanskrit novelists whose works are extant, preceding Subandhu, the author of the romance *Īśavādattā*, which formed the model for Bana's *Kādambarī*. Dandin's works have been edited several times: *Daśa-kumāra-carita* (Bombay, 1889), and translated into English by Jacob, under the title *Hindoo Tales* (London, 1873), by Bhattacharyya (Calcutta, 1899—incomplete), into French by Fauche (Paris, 1862), and into German by J. J. Meyer (Leipzig, 1902). There is an edition with German translation of the *Kāvya-darśa* by Böhtlingk (Leipzig, 1890).

DANDIN, dān'dān', GEORGES. The hero of Molière's comedy of that name. He is a wealthy bourgeois who marries the daughter of a noble, and is compelled to support his wife's family and to put up with their contemptuous treatment. He expresses his helpless regret for his self-inflicted troubles in the much-quoted phrase, "Vous l'avez voulu, Georges Dandin."

DANDIN, PERRIN. The ridiculous judge in Racine's farce *Les Plaideurs*. The character is introduced also by La Fontaine in the *Fables*.

DANDOLO, dān'dō-lō. A famous Venetian family, already powerful in the seventh century. The most illustrious of its members was ENRICO DANDOLO, born about 1108. Eminent in learning, eloquence, and knowledge of affairs, he ascended from one step to another until, in 1171, he was sent as ambassador to Constantinople, and, in 1192, was elected Doge. In this latter capacity he extended the bounds of the Republic in Istria and Dalmatia, defeated the Pisans, and took part in the Fourth Crusade (q.v.). By this, Venice obtained great possessions in the Ionian Sea and the Archipelago, several harbors and tracts of land on the Hellespont, in Phrygia, the Morea, and Epirus, and also, by purchase, the island of Crete. Dandolo had for his special portion one-half of Constantinople. Soon after the conquest of the Byzantine Empire by the Crusaders, Dandolo died (June 4, 1205) in Constantinople, and was buried in the Church of Saint Sophia. His monument was destroyed by the Turks at the taking of Constantinople, in 1453. —ANDREA DANDOLO, Doge from 1343 to 1354, was the author of a Latin chronicle recording the history of Venice from the Pontificate of Saint Mark to the year 1339 in ten books. The last seven books are printed in Muratori, *Rerum Italicarum Scriptores*, vol. xii., (Milan, 1723-51).

DANDOLO, VINCENZO, Count (1758-1819). An Italian chemist and agriculturist. He was born in Venice, studied at Padua, and became a chemist in his native city. When Venice came under Austrian rule, he went to Milan, where he became a member of the Grand Council of the Cisalpine Republic. He went to Paris in 1799, but soon afterwards returned to the vicinity of Milan and engaged in scientific agriculture. In 1805 Napoleon made him Governor of Dalmatia, where he proved himself an excellent officer. In 1809 he returned to his estate near Varese, where he contributed much to the progress in silk-worm culture. He published *Fondamenti della fisico-chimica applicati alla formazione de' corpi e de' fenomeni della natura* (6th ed. 1796); and *Il buon governo de' bachi da seta* (1816).

DANDRUFF. See HAIR.

DANE, GREAT, or GERMAN BOARHOUND. See HOUND.

DANE, NATHAN (1752-1835). An American legislator and jurist, born in Ipswich, Mass. He graduated at Harvard in 1778; studied law in Salem; began to practice in 1782 at Beverly, and was successively a member of the Massachusetts House of Representatives, the Continental Congress, and the Massachusetts Senate. In addition, he held various commissions to codify or revise laws, and was judge of Common Pleas. While in Congress, he was a member of the committee appointed to draw up an ordinance for the government of the Northwest Territory, and made the original draft of that document, though in a larger sense it seems that Manasseh Cutler (q.v.) probably deserved the credit of authorship. The question of the relative credit due to each man has, however, been much debated. He was a member of the Hartford Convention (q.v.) in 1814. Dane contributed \$15,000 toward founding the Harvard Law School, and the Dane professorship of law was named in his honor. He published *A General Abridgment and Digest of American Law* (1823-29), and an *Appendix* (1830).

DANEBROG, dān'e-brög, ORDER OF. The second in rank of the Danish Orders, instituted by Waldemar II., in 1219. According to tradition, the Order was founded in honor of the banner of Denmark, which graciously fell from heaven for the inspiration of the army. In 1500 the Order was suppressed, but reinstated in 1671, by Christian V. In 1808 Frederick VI. made it an Order of merit for all the Danish people. The Danebrog has four degrees, besides a class composed of those on whom the Cross has been bestowed for certain meritorious services, but who are not members strictly of the Order. These are known as 'Danebrogsmænd.' The decoration of the Order consists of a cross of gold *patée*, enameled with white, and bordered with red, or gold.

DANEGELD, dān'gēld, or **DANEGOLD**, dān'gōld' (AS. *Denc*, Danes + *geld*, *gild*, payment, Goth. *gild*, tax, OHG. *gelt*, Ger. *Geld*, money). A tax of two shillings upon each hide of land, first levied by the Witan under the Saxon King Ethelred the Unready, in 991. It was probably the first money taxation imposed in England, and was used as tribute money for the Danes. The tax was collected four times within the next twenty years. Edward the Confessor abolished the impost, but William the Conqueror, in 1084, demanded from each hide of land, not held by himself in demesne, or by his barons, a sum of six shillings, or three times the old rate. In this manner the hated tax became a permanent source of income. In 1198 the rate was fixed at five shillings on a hundred acres of land. Stephen (1135-54) promised to abolish Danegeld, but it was not repealed till Henry II.'s time (1163). The tax, however, was secured in other ways, under the head of aid.

DANELAGA, dā'ne-lā'gā, or **DANELAW**, dān'lā' AS. *Denc*, Danes + *lagu*, Engl. *law*). The name applied to that part of England which by the treaty of Wedmore or Chippenham, in 878, was ceded to the Danes by Alfred the Great. It included Northumbria, East Anglia, Essex, and the northeastern part of Mercia, the boundary line being constituted by

the rivers Thames, Lea, and Ouse, and by the ancient Roman road of Watling Street. Within this region the laws and customs of the Danes were distinctly recognized and were later enumerated by Canute. The term Danelaw is used in contradistinction to Mercian and West Saxon law, until after the reign of Stephen (1135-54).

DAN'ENHOWER, JOHN WILSON (1849-87). An American Arctic explorer, born in Chicago. He graduated at the United States Naval Academy in 1870, served for a time in the line and on the coast survey, and in 1878 joined the *Jeanette* expedition for polar research, commanded by Lieutenant De Long, U. S. N. The ship was crushed in the ice, June, 1881, in latitude 77°, longitude 157° E. Traveling by sleds, the crew reached Bennett's Island, July 27, whence they embarked in three whaleboats for the Siberian coast. The one containing Lieutenant Danenhower and ten others, in command of Chief Engineer G. W. Melville, arrived at the Lena delta in September. Danenhower reached New York in June, 1882, and was compelled by an affection of the eyes to desist from further explorations. He published *Narrative of the Jeannette* (1882).

DANES ISLAND. A small island off the northwestern coast of Spitzbergen (Map: Arctic Region, G 4). André started from here for the North Pole, July 11, 1897.

DANEWORT. See ELDER.

DAN'FORTH, MOSELEY ISAAC (1800-62). An American engraver, born in Hartford, Conn. He was one of the founders of the New York Drawing Association (1825) and of the National Academy of Design (1826). He lived in London for ten years, during which time he executed some well-known drawings of the Elgin Marbles and many plates, besides engravings of the "Sentry Box," "Don Quixote," and portraits of Washington Irving and others. On his return to America he worked principally upon bank-note engraving.

DANGEAU, dān'zhō, PHILIPPE DE COURCILLON, Marquis de (1638-1720). A French historian. After commanding the King's regiment he became aide-de-camp to Louis XIV., and in this capacity took part in the principal campaigns of the period. In 1667 he was appointed Governor of Touraine. He was a favorite at Versailles, enjoyed the fullest confidence of the King, and was the patron of Boileau, who addressed to him the well-known satire on the nobility. He was frequently sent on diplomatic missions, and it was he who encouraged the marriage between Mary of Este (Modena) and James II. of England. The *Journal* of Dangeau is one of the best historical documents on the reign of Louis XIV.

DANGLE. A fatuous virtuoso, the leading character in Sheridan's *The Critic*, said to have been intended for Thomas Vaughan, an inferior playwright.

D'ANGOUËME, dān'gōō'lām'. See ANGOULÈME.

DANHAUSER, dān'hōu-zēr, JOSEPH (1805-45). An Austrian painter, born in Vienna. He studied at the Vienna Academy under Peter Krafft, and first appeared as an historical painter with scenes from the *Rudolph von Habsburg* (Vienna, 1824) of Johann Ladislaus Pyrker.

At Pyrker's invitation he went to Venice, where he determined to attempt genre subjects, in which he was very successful. He had abundant humor and fancy, and possessed a manner which, if somewhat glassy in its coloring, is nevertheless remarkable for its observant and skillful execution. His works include "The Death of Ottokar" (1832); "The Martyrdom of Saint John" (1835), in the Cathedral of Erlau; "Hagar and Ishmael" (1836), in the Vienna Museum; "The Gourmand" (1838); "The Widow's Mite" (1839), and "Liszt at the Piano" (1840).

DANICAN, dá'nó'kán'. FRANÇOIS ANDRÉ. See PHILIPOR, FRANÇOIS ANDRÉ DANICAN.

DANIČIĆ, dā'né-chích, GJURO (1825-82). A Servian philologist, born in Neusatz. He studied at Pesth and Vienna, and became librarian of the National Library at Belgrade, and afterwards professor of the history of literature in the university there. In 1877, under commission of the Academy of Sciences at Agram, he began the compilation of the Servian-Croatian dictionary, of which he finished but three parts. His works further include a Servian grammar (1863; 8th ed. 1892) and a history of the Servian and Croatian languages (1874).

DAN'IEL (Heb., God is my judge). In the Book of Ezekiel (xiv. 14, 20 and xxviii. 3), a personage introduced with Noah and Job as a proverbial type of wisdom and righteousness. It is this traditional Daniel, of whom nothing certain is known, who is made the hero of the Book of Daniel by the author (or authors), otherwise unknown, who lived and wrote in Jerusalem in the days of Antiochus IV. (B.C. 175-164). The author of the book makes Daniel a Jewish captive carried to Babylon in the third year of Jehoiakim (B.C. 605), who through his supernatural wisdom rose to a prominent position at the Court of Nebuchadnezzar (Dan. i.-ii.), and whose career is made to extend into the reign of Cyrus (Dan. x. 1). Daniel is referred to also in I. Macc. ii. 60, and in the New Testament (Mat. xxiv. 15; Mark xiii. 14); the first passage contains a reference to the story of the lion's den; in the second he is called "Daniel the prophet." See DANIEL, BOOK OF.

DANIEL, BOOK OF. A composition of about the year B.C. 165, written by a Jewish patriot as an exhortation and encouragement to the Jews, who at the time were sorely oppressed and hindered in the free exercise of their religion by Antiochus IV., surnamed Epiphanes. The book, comprising twelve chapters, consists of several distinct parts, and no less than ten detached sections may be distinguished. These sections may be considered as falling into three groups: (1) Introduction, chapters i.-ii., containing two sections; (2) chapters iii.-vi., containing four narratives; (3) chapters vii.-xii., comprising four prophetic visions. The first section relates how Daniel was brought to Babylon by Nebuchadnezzar in the third year of Jehoiakim (B.C. 605). With Daniel are three other youths of noble descent—Hananiah, Mishael, and Azariah. Babylonian names are given to them in place of their Hebrew ones, Daniel being called Belshazzar, while the other three are called Shadrach, Meshach, and Abednego. They are portrayed as being in the royal service, but also as steadfast in their fidelity to their God, declining to par-

take of the food provided for them for fear of polluting themselves. God rewards them for this, and when brought before the King they are found ten times superior to the Babylonian magicians, Daniel excelling every one in the matter of visions and dreams. In the second section proofs are given of Daniel's supernatural wisdom; he saves the lives of the magicians as well as his own by his ability not only to interpret a dream Nebuchadnezzar had had, but also to tell him what the dream was. The King had seen a great image with its head of gold, and other parts of the body of silver, brass, and iron. The gold is interpreted to refer to the Babylonian Empire, the other three metals to the kingdoms that are to follow the Babylonian. The image is destroyed by a stone quarried without human intervention out of a mountain, and this destruction symbolizes the disappearance of all the kingdoms. The third section (chap. iii.) tells of the fiery furnace into which the three friends of Daniel are thrown because of their refusal to worship the golden image which Nebuchadnezzar had set up, and how they came out of the furnace unscathed. In the fourth section (chap. iv.) Nebuchadnezzar issues a proclamation to all peoples of the world, declaring, in consequence of Daniel's success in interpreting another of his dreams, his intention of glorifying the King of Heaven, i.e. Jehovah. The dream itself consists of a vision of the uprooting of a great tree with its numerous branches, under which all birds have shelter and which feeds all mankind. The vision, as interpreted by Daniel, forebodes the downfall of the kingdom, and the King himself is humbled by being bereft for a time of his reason and conducting himself like an animal. The fifth section (chap. v.) recounts a great feast arranged by Belshazzar (q.v.), during which the mysterious writing appears on the wall as a punishment for the King's desecration of the sacred vessels of Jerusalem, which Nebuchadnezzar had brought to Babylon (chap. i. 2). Daniel succeeds in reading and interpreting the handwriting, which predicts the overthrow of Belshazzar, who indeed is slain that very night. The crown passes to Darius the Mede. The sixth section (chap. vi.) introduces King Darius, who, at the instance of his nobles, issued a decree forbidding any one for the space of a month to pray to or ask a petition from any one except Darius. Daniel, as a pious Jew, accustomed to pray thrice daily, disobeys and is thrown into a den of lions. By divine protection Daniel escapes the fate of being torn to pieces. He is taken out of the den and his accusers are thrown into it, and at once are torn to pieces by the lions. The last four sections contain visions of Daniel: (1) Of the four beasts, the last having ten horns, from each of which in turn supremacy is taken away (chap. vii.). (2) of the ram pushing in all directions with its two horns, which are eventually broken through a he-goat with a notable horn between its eyes. In time the kingdom of the he-goat is broken, and in its place four other horns arise, and out of one of these comes forth a little horn which exalts itself even against the host of heaven and against God Himself, destroying His sanctuary and interrupting the daily service for 2300 evenings and mornings (chap. viii.); (3) Gabriel appears to Daniel and explains that the seventy years of desolation prophesied by Jer-

miah (xxv. 11; xxix. 10) will be only seventy weeks, after which time the guilt of the people will be atoned for (chap. ix.). In the last vision, in the third year of Cyrus, an angel reveals to Daniel glimpses of the future. Under veiled names the doings and fate of various kings are described; after the last disappears the Messianic age arrives, heralded by the Archangel Michael.

There is no longer any question among scholars that all the narratives and visions refer to conditions as they existed in Jerusalem in the days of Antiochus IV. A difference of opinion merely exists on the question whether the book is an organic unity or the work of several authors pieced together. The trend of opinion is now in the direction of regarding the book as a unit, in view of the uniformity of style and the references in one part to matters referred to in another. In chapters i.-ii. 4 the author writes in Hebrew; beginning in ii. 4, since he introduces 'Chaldeans,' he continues in Aramaic, the current speech of Babylonia (though not the official language); but in chapter viii., and thence to the end, he returns to Hebrew. The supposition that the Hebrew portions replace the lost original Aramaic is without sufficient foundation. On the basis of the theory currently adopted, the interpretation of the figures and metaphors in the book is not difficult. Nebuchadnezzar, Belshazzar, and Darius are disguises for Antiochus IV. The four metals of which the image is composed represent the Babylonian, Median, Persian, and Macedonian empires, and the four beasts are to be similarly interpreted. The little horn is again Antiochus, while the ten horns represent the successors of Alexander the Great. The ram with two horns represents Medo-Persia and the he-goat the Greeks. The kingdoms in the last vision are the four Persian kings, Alexander, and his successors, the detached references being to leagues and conflict with Egypt during their régimes and to other occurrences. The tyranny of Antiochus IV., whose aim it was to replace Jewish rites by Greek forms of worship, led to the Maccabean uprising which marks the temporary triumph of Jewish patriotism. The struggle in Palestine represents from the broader historical point of view the natural conflict between Greek and Jewish ideas brought about through the meeting of Jew and Greek after the conquests of Alexander.

BIBLIOGRAPHY. See the commentaries of Kamphausen, Bevan, Prince, Hitzig, Ewald (*Prophets of the Old Testament*), Bruston, Keil, and Meinhold. Of these the latest is that of Prince (New York, 1899), and one of the best that of Meinhold (Leipzig, 1889).

DANIEL, dá'nyél', ANTONY (1601-48). A French Jesuit missionary in America, born at Dieppe. He came to Quebec with Samuel de Champlain in 1633, began his labors among the savages of Cape Breton, and in 1634 was transferred to the Huron mission. His station was at Saint Joseph, or Teanastayé, one of the largest of the Huron towns. On July 4, 1648, he had just concluded the service of the mass when the town, from which most of the warriors were for the time being absent, was attacked by a band of the hostile Iroquois. He roused such defense as was possible, administered the sacrament of baptism to those unbelievers who, in the face of this danger, were clamorous to receive it,

and urged all that could to escape. As he came from the church and confronted the enemy, he for a space overawed them by his calmly majestic bearing. A moment later, pierced by a bullet, he fell, and his body was consumed in the burning church. Consult Parkman, *The Jesuits in North America* (Boston, 1867).

DANIEL, ARNAUT. A celebrated French troubadour of the twelfth century, styled by Petrarch 'Il gran maestro d'Amore' (the great master of love). He was born at Riberae, Dordogne, was a juggler at the Court of Richard Cœur de Lion, and is said to have been present at the coronation of Philip Augustus and to have been acquainted with several distinguished troubadours, such as Bertrand de Born. He was the author of a number of amatory poems, which, although technically masterpieces of versification, are frequently characterized by an artificial straining after effects. Dante, although indebted to him for several of his stanzas, places Daniel far beneath Giraud de Borneil, then regarded as the greatest of troubadours. An admirable modern edition of Daniel's works has been published by Canello under the title *La vita e le opere del trovatore Arnaldo Daniel* (Halle, 1883).

DANIEL, dä'né-él, ERNST VON (1843—). An Hungarian politician, born at Ellemér, County of Torontál. He studied law at Budapest, became judge-lateral in 1868, and in 1870 a Liberal member of the Hungarian Parliament. In 1895 he was appointed Minister of Commerce, and in 1896 a member of the Table of Magnates.

DANIEL, GEORGE (1616-57). A Cavalier poet, about whom very little is known. His best verse is represented by *Occasional Poems and Scattered Fancies*, composed in 1645-46. The beautiful MS. copy of his poems was printed (in a limited edition) by Grosart (4 vols., Blackburn, Lancashire, 1878).

DANIEL, HERMANN ADALBERT (1812-71). A German geographer and theologian. He was born at Cöthen, studied theology at Halle in 1830-34, and was from 1834 to 1870 instructor and professor at the Pädagogium there. He was one of the most eminent followers of the geographer Ritter, and by the attractive style of his various geographical writings greatly contributed toward arousing an increased interest in the study of geography in the schools and among the educated generally. Of these works the following deserve especial mention: *Lehrbuch der Geographie für höhere Unterrichtsanstalten* (76th ed. 1895); *Leitfaden für den Unterricht in der Geographie* (201st ed. 1896); *Handbuch der Geographie* (6th ed., 4 vols., 1894-95); all of which were translated into several European languages.

DANIEL, JOHN MONCURE (1825-65). An American editor, born in Virginia. He was privately educated, studied law, and in 1845 became librarian of a small public library in Richmond. In 1847 he joined the staff of the *Richmond Examiner*, and as the result of expressions contained therein was compelled to fight numerous duels. He was a friend of Theodore Parker, whose famous sermon on Webster he published in the *Examiner*, and of Poe, a sketch of whom he wrote for the *Southern Literary Messenger*. In 1853 he was appointed Minister to the Court of Victor Emmanuel. By demanding for some Italians naturalized in the United States and visiting Sardinia rights equal to those of other Ameri-

cans, he nearly brought about a rupture in the diplomatic relations of Italy and the United States, and afterwards, by a breach of social etiquette at Turin, he greatly lessened his influence at the Italian Court. Upon the outbreak of the Civil War he was appointed to the staff of Gen. A. P. Hill. His arm having been shattered, he resumed the *Examiner*; and for attacks upon Jefferson Davis and Elmore, the Treasurer of the Confederacy, was challenged by the latter to a duel, in which he was wounded. Consult his *Writings*, with a memoir by his brother (New York, 1868).

DANIEL, JOHN WARWICK (1842—). A United States Senator, born in Lynchburg, Va. After the Civil War, in which he fought on the Confederate side and rose to the rank of colonel, he studied law and became active in politics. He was for some time a member of the State Legislature, and in 1885-87 served in the United States Senate.

DANIEL, SAMUEL (1562-1619). An English poet, born near Taunton, Somersetshire. He entered Magdalen Hall, Oxford, in 1579, but left without a degree and visited Italy. In 1590 he became tutor to William Herbert at Wilton and wrote masques for the Court of James I. Later he retired to a farm near Beckington, in Wiltshire, where he died in October, 1619. Daniel's principal works are a series of sonnets to Delia (1592), unsurpassed in their time by any except Shakespeare's; the beautiful *Complaint of Rosamond* (1592); a long historical poem in eight books, entitled *The Civil Wars Between the Houses of York and Lancaster* (1595-1609); two tragedies in the style of Seneca; and a prose history of England. Daniel's verse has been praised for its grace and purity by a long succession of critics. His works were collected in 1623. Consult *Complete Works*, edited by Grosart (5 vols., London, 1885-96).

DANIEL DERON'DA. A novel by George Eliot published serially in 1876 and in book form in 1877. It is a study of race feeling and tradition, the title character being a Jew.

DANIELL, JOHN FREDERICK (1790-1845). A distinguished English physicist, born in London. He was elected a fellow of the Royal Society in 1814, and in 1816, in connection with Professor Brande, established the *Quarterly Journal of Science and Art*. From this period he devoted almost all of his time to the subjects of chemistry and meteorology. In 1824 the Horticultural Society awarded him their silver medal for his *Essay on Artificial Climate*. He was appointed professor of chemistry in King's College, London, in 1831, and in 1839 published his *Introduction to Chemical Philosophy*. He is the only person who ever obtained all of the three medals in the gift of the Royal Society. His *Meteorological Essays* contain the first scientific account of the known phenomena of the atmosphere. He made the first precise determinations of atmospheric moisture by the use of the hygrometer of his invention, and invented the *Daniell cell*, an electric battery furnishing a tolerably constant current. Besides the works mentioned he wrote a large number of interesting and valuable papers for the Royal Society.

DANIELL, THOMAS (1749-1840). An English painter and etcher, born at Kingston-on-Thames. He was a pupil of the Royal Academy

and was elected an R.A. in 1799. Accompanied by his nephew William, he went to India in 1784 and remained in the East ten years. The fruit of these travels was the remarkable collection, "Oriental Scenery" (1808, 144 views). Besides these he published "Views in Egypt," "Hindu Excavations at Ellora" (24 plates), and *Picturesque Voyage to China by Way of India* (London, 1810).

DANIELS, WINTHROP MORE (1867—). An American political economist, born at Dayton, Ohio. He graduated in 1888 at Princeton University, studied at Leipzig, and in 1892 was appointed professor of political economy at Princeton. His publications include *Elements of Public Finance* (1894) and a *Revision and Continuation of Alexander Johnston's History of the United States* (1897).

DANILO, dan'ŭ-lŏ, I., or **DANILO PETROVITCH NIEGOSII** (1826-60). A prince of Montenegro. He was educated at Vienna and succeeded his uncle, Peter II., in 1851, dispensing, however, with the customary title of prince-bishop. In 1852 he became involved in a war with Turkey, the Porte claiming jurisdiction in Montenegro, and the boundaries between the two countries were not defined until 1858. Danilo devoted himself steadfastly to the achievement of Montenegrin independence and the furtherance of civilization throughout the land. He introduced financial reforms, organized a military service, and issued a legal code. He was assassinated by a personal enemy, August 12, 1860. His nephew, Prince Nicholas, succeeded him.

DANISH LANGUAGE AND LITERATURE.—LANGUAGE. The history of the Danish language begins properly about the year A.D. 1000, when the different Scandinavian dialects, which until that time had formed one speech, developed into separate languages. (For an account of the earliest Scandinavian monuments, see **RUNES**.) The Danish and Swedish formed together the East Northern group, the Icelandic and Norwegian, with the Faroese, the West Northern. The oldest specifically Danish records are runic inscriptions and a few names in Latin MSS. About 1300 appeared several collections of laws, which show the existence of at least three distinct dialects, there being at that time no standard form for literary use. The leveling of inflections, which is as marked a feature of Danish as of English, had already begun, although many forms were still retained. The vocabulary is still in the main Northern, with very few foreign elements. Between 1350 and 1500 the loss of inflections and of other grammatical distinctions increases rapidly and the language approaches more and more its present form. A striking feature of the vocabulary is the introduction of foreign words, especially those from the French, Latin, and Low German, High German words being sparingly borrowed. The syntax, too, is affected by Latinisms in consequence of the wide use of Latin by Danes. As a result of the publication of the first modern Danish translation of the Bible, that of Christian III. (1550), the vocabulary became fairly fixed, receiving practically its present character. The relation of the Danish Bible to the Danish language is very similar to that of the English Bible to the English lan-

guage. After 1537 Danish became the official language of Norway, the Norwegian language remaining as a collection of dialects spoken chiefly in the country districts. (For the relation of these dialects to Danish, see **NORWEGIAN LANGUAGE**.) In the following century, on the other hand, Denmark suffered a loss by the cession to Sweden of the Province of Skåne, or Schonen, and within a generation the Swedish took the place of the original Danish.

The principal grammatical changes between the Reformation and 1700 are the partial substitution of the natural for the grammatical gender, and the simplification of the inflections. The vocabulary shows a generous borrowing of French and German words. The different dialects are still used for literary expression, and it was not until Holberg (1684-1754) that a standard literary Danish may be said to have existed. During the last half of the eighteenth century German and Danish were used side by side in Denmark, very much as Latin and Danish had been used earlier, and so great was the German influence that the Danish State Calendar was published in that language until the first year of the nineteenth century. During the last thirty years, mainly as a result of the war with Germany, the vocabulary has become more and more pure. Whole classes of German words have been replaced by Danish equivalents, and no new German words have been borrowed.

Danish differs in general from its nearest Scandinavian neighbor, Swedish, by a greater leveling of inflections and by less archaic sounds. The most striking single feature of the spoken language is the glottal 'catch,' called in Danish *Stød* (literally a push or thrust). It occurs after certain consonant sounds and consists of a momentary closure of the glottis. It has been compared in its effect upon foreigners to a hicough. The glottal catch is not found in Dano-Norwegian, and it is lacking in some of the dialects in Denmark, while Jutish occasionally employs the catch where it is not found in the Seeland dialect. The cultivated standard speech is characterized by a marked tendency to slurring, the enunciation being much less distinct than that of Swedish or of the Danish spoken in Norway. There is also much less vocal inflection. In Danish, as in German, the pronunciation of the stage is very different from that of social intercourse.

The principal Danish dialects are the Seeland, including the slightly differing uses of the neighboring smaller islands, and with a distinct type for Copenhagen, the Jutish, including the speech of Schleswig, and the Bornholmsk, which latter is the sole remnant of the East Danish dialects. The Dano-Norwegian will be considered in connection with the Norwegian (q.v.). Mention should be made of the Danish spoken in the United States, which really constitutes a modern dialect. It differs from the home tongue in pronunciation, apparently as a result mainly of English influence, and in vocabulary. Danish-American newspapers contain many English words not recognized in Denmark, and the speech of our Danish citizens is even more mixed, the English influence extending to the syntax as well as to the vocabulary. As the subject has never been scientifically investigated, it is impossible to determine how far the original dialectic peculiarities are preserved.

Danish orthography is in an even more unsettled state than the English. There are several distinct systems of spelling in use in Denmark, and at least two others in Norway. The official system is employed in all school books and Government publications, but is generally disregarded by writers, whose system in turn is scorned by philologists. As in German, both the so-called Gothic and Roman type are in use, and substantives are sometimes uniformly spelled with initial capitals, sometimes not. There is, however, a decided tendency in recent times toward simplification of spelling, and in time uniformity will probably be reached.

BIBLIOGRAPHY. Dictionaries: Molbeek, *Dansk Ordbog* (Copenhagen, 1854-59), the standard dictionary in Danish; Larsen, a *Dictionary of the Dano-Norwegian and English Languages* (3d ed., London, 1897); Rosing, *English-Danish Dictionary* (7th ed. Copenhagen, 1899); Brynildsen, *English-Dano-Norwegian Dictionary* (Christiania, 1900—). This last, when completed, will be the best Danish international dictionary. There are also several dictionaries of foreign words in Danish, and dictionaries giving simply the forms of words. Pronouncing dictionaries are very little used. Grammars: Groth, *Danish and Dano-Norwegian Grammar* (Boston, 1894), especially strong in the treatment of the Dano-Norwegian. There is no good treatment in English of Danish grammar. The best grammars in Danish are Jessen's and Mikkelsen's. The best recent history of the language in Danish is Verner Dahlerup's (Copenhagen, 1896). There is a short survey by Ludvig Wimmer, translated by Lentzner, in *Modern Language Notes* (Baltimore, 1895). The oldest period is treated technically by Noreen in Paul, *Grundriss der Germanischen Philologie*, vol. i. (Strassburg, 1896).

LITERATURE. The first Danish book is a treatise on medicine by Henrik Harpestreng, who died in 1244. The first Danish law dates from 1386, but the first distinctively literary writings in the language are the chivalric ballads, *Kjæmpeviser*, which must have been composed from 1300 to 1500, though they survive only in sixteenth-century form, best edited by Gruntvig (6 vols., unfinished) and by Abrahamson, Nyerup, and Rabbek (5 vols., 1812-14). Of these there are some 500, partly historical, partly mythical, but wholly popular in origin. The first Danish book was printed in 1495, and sequential literary history begins with Christian Pedersen, who translated the Bible (1550) and gave to his people the legends of Charlemagne and Ogier in their final form. Vedel (1542-1616) stimulated national literature by publishing 100 of the *Kjæmpeviser* (1591) and translating Saxo Grammaticus (1575). *Reynard the Fox* had been translated into Danish in 1555. Hvitfeld gave Denmark its first history (1595) and Rauch its first drama (about 1600). Clausen's translation of the Icelandic *Heimskringla* appeared in 1633, and Arrebo's (1587-1637) *Hæwæron*, the first Danish epic, in 1641. Hymn-writing was soon after inaugurated by Kingo (1634-1703) and Brorson (1694-1764). But these beginnings were all overshadowed by the genius of Holberg (q.v.), the first Dane whose work is still an actuality in Danish culture. All branches of learning and art felt his stimulating influence, the university was reopened (1742), the Society of Sciences founded, and the Society

for the Improvement of the Danish Language, then Klopstock, who had settled at Copenhagen, though his direct influence was bad, fostered the founding of the Society of the Fine Arts, and Frederick V. patronized all.

Under these influences, or the spirit that prepared for them, many poets were born (1742-49)—Johannes Ewald, Wessel, Brun, Frimann, Fasting, Pram, Storm—who brought about a lyric and dramatic revival in the last quarter of the century. The first, Ewald (q.v.), aided the revival of interest in Scandinavian mythology; Wessel helped to emancipate the Danish stage from French bondage; the others, Norwegians by birth, gave the language a richer imagery. The only prose writer of importance till near the close of the eighteenth century was the philosopher Treschow (1751-1833); and poetry, after the passing of the group just named, sank into a mechanical insignificance, from which Baggesen (q.v.) and romanticism revived it.

The literary births from 1758 to 1777 are mainly of prose writers—Rahbek (1760-1830), a good novelist, catholic-spirited critic, and editor of older poets; Heiberg the elder (1758-1841), a political and æsthetic critic; Malte-Brun (1775-1826) and Olufsen (1764-1827), geographers; Nyerup (1759-1829), a diligent literary compiler; Engelstoft (1774-1850), an historian; Mynster (1775-1854), a theologian; and the great and genial scientist Oersted (1777-1851), are the most prominent names for two decades, where the only poet of distinction is Baggesen (1764-1826), an erratic exception to prove the rule that an 'age of enlightenment is not an age of song.'

The romantic movement in Denmark centres around Oehlenschläger (q.v.), and dates from 1802. His more important assistants in fostering national individualism in literature were Blicher (q.v.), novelist and poet; Grundvig, scholar, antiquarian, poet, politician; Ingemann (q.v.), the historical novelist; Hauch (q.v.), a dramatist and novelist; Countess Gyllembourg-Ehrensvard (q.v.), the greatest woman writer of Denmark, and mother of J. L. Heiberg (q.v.), critic, poet, dramatist, and, on the whole, the most important figure of the generation. These writers were born between 1779 and 1791. To the second generation of the romanticists, born between 1798 and 1809, belong Hertz (q.v.), the poet; Andersen, of the world-famed *Fairy Tales*; Bagger (1807-46), who died like Keats, with unmatched promise unfulfilled, and Paludan-Müller (1809-76), a dramatic and epic philosophic poet of much power.

Aside from poetry the romantic period was not fruitful. One may note the antiquarians Rask (1787-1832), Rafn (1795-1864, q.v.), and Petersen (1791-1862); the lexicographer Molbeek (1783-1857); the botanist Schouw (1789-1852); and the philosopher Sibbern (1785-1872); succeeded by the brilliantly subtle Kierkegaard (1813-55). The period counts no significant novelist or dramatist who was not primarily a poet, though writing perhaps like Andersen in prose.

The thirty odd years that separate the birth of Paludan-Müller from that of Brandes are singularly unproductive of Danish literary genius. The most prominent names are those of the poet Ploug (1813-94), the novelist Goldschmidt (1819-87), and Herman Ewald (1821—). Politics absorbed popular interest after 1848. Romanticism

seemed bankrupt, but the Danes were slow in attuning themselves to the modern spirit of realism. That they have done so at all, through political distractions, national humiliation and dismemberment, is largely the work of Brandes, supplemented by the example of Björnson and Ibsen. Of the new school the most distinguished are Drachmann (q.v.), Richardt (q.v.), and Christiansen (q.v.). One may record also the names of Bergsøe (1835—, q.v.), Jacobsen (1847-85), Skram (1847—), Edward Brandes (1847—), Bang (1857—), Gjellerup (1857—), and Esmann (1860—), but there seems little promise of greatness in any field of literature in the Denmark of this generation.

BIBLIOGRAPHY. Horn, *Den danske Litteraturs Historie* (Copenhagen, 1879); translation by Anderson, *History of the Literature of the Scandinavian North* (Chicago, 1884); Hansen, *Nordiske Digtere i vort Aarhundrede* (Copenhagen, 1879); id., *Illustreret dansk Literaturhistorie* (ib., 1900); Romring, *Den danske Literaturshistorie i Grundrids* (ib., 1890); id., *Rationalismens Tidsalder* (ib., 1886-90); Rosenberg, *Nordboerens Aandsliv fra Oldtiden til vore Dage* (ib., 1878-85), incomplete, but highly important; Arentzen, *Baggesen og Oehlenschläger* (ib., 1870-78); id., *Danske Digtere i det 19de Aarhundrede* (ib., 1864); Vedel, *Studier over Guldalderen i dansk Digtning* (ib., 1890); Paludan, *Renaissance bevægelsen i Danmarks Litteratur isaer i det 18de Aarhundrede* (ib., 1887); Schück, "Schwedisch-dänische Litteratur," in Paul, *Grundriss der germanischen Philologie* (Strassburg, 1896 et seq.); Strödtmann, *Das geistige Leben in Dänemark* (Berlin, 1873); Schweitzer, *Geschichte der skandinavischen Litteratur* (Leipzig, 1886-87); Hansson, *Das junge Skandinavien* (Dresden, 1891); Schwanenflügel, "Danish Literature," in Weitemyer, *Denmark* (London, 1890); Gosse, *Studies in the Literature of Northern Europe* (London, 1879). For the drama consult: Brandes, *Dansk Skuespil-kunst* (Copenhagen, 1880); Birket Smith, *Studier paa det gamle danske Skuespils Omraade* (ib., 1883); and Hansen, *Den danske Skueplads* (ib., 1889 et seq.).

DANISH POLITICAL PARTIES. See POLITICAL PARTIES, paragraph on *Denmark*.

DANISH WEST INDIES. See WEST INDIES, DANISH.

DAN'ITES, or DESTROYING ANGELS. In American history, a name given to members of a secret society, connected either officially or unofficially with the Mormon Church, which was organized about 1837 for the purpose, as alleged, of 'dealing as avengers of blood with Gentiles.' Many crimes and atrocities have been attributed to the organization, but little definite information has ever been obtained concerning it, and the Mormons themselves either disavow any connection with it, or flatly deny its existence. Other names by which the society was known are: Daughters of Zion, Big Fan, Daughters of Gideon, and Flying Angels, though these were used much less frequently than the term 'Dan-ites,' or 'Sons of Dan,' which is said to have owed its origin to Gen. xlix. 17 ("Dan shall be a serpent by the way, an adder in the path, that biteth the horse's heels, so that his rider shall fall backward"). During the political campaign of 1858 in Illinois, which has become famous be-

cause of the contest between Lincoln and Douglas for the United States Senatorship, the term 'Dan-ites' was applied as a nickname to the anti-Douglas Democrats, whose greatest vote (5079) was cast in that year for the candidate for State Treasurer. The faction was charged with servile acquiescence in the policies of President Buchanan, who was then under fire for his attitude toward the 'rebellion' in Utah.

DAN'NAT, WILLIAM T. (1853—). An American painter, born in New York City. He studied in Munich and under Munkacsy in Paris, where he afterwards took up his residence and became a teacher at the Ecole des Beaux-Arts. But he owes more to Manet and Degas than to his own master. One of his first pictures, "The Quartette" (1884), now in the Metropolitan Museum, New York City, is a fine example of his earlier work. It shows the technical ability, the daring style, the solid, broad painting, and absence of conventionality characteristic of all his work. Among the many Spanish subjects done at this time are a "Sacerdote in Arragon" (1888), in the Chicago Art Museum, and "A Café Chantant" (Munich, 1892), which was the sensation of the Exhibition. For sheer bravura, this startling, masterly study of artificial light has been equaled by no other American artist, and by few foreigners. His "Lady in Red," a one-color scheme, is in the Luxembourg. The difficulties presented by such a subject as this one are managed with consummate ease. Something in the same manner is his "Lady in White." Among the portraits that have made him at once criticized and praised is that of "Madame E." (Salon of 1895), the three-quarter length of a woman, almost colorless except for the vivid red of her lips. He joined the Society of American Artists in 1881, and became a member of the Société Nationale des Beaux-Arts. He was one of the International Art Jury in 1889, and the same year received the cross of the Legion of Honor. Consult: Muther, *Painting in the Nineteenth Century* (New York, 1896); Hartmann, *History of American Art* (Boston, 1902).

DANNECKER, dän'nek-er, JOHANN HEINRICH VON (1758-1841). A German sculptor, born near Stuttgart, October 15, 1758. His father, a groom of the Duke of Württemberg, was much opposed to his studying art, but through the favor of the Duke the lad was educated in the Karlssehule at Ludwigsburg, where he formed his life-long friendship with Schiller. He afterwards studied sculpture under Le Jeune, and in 1780 he obtained the prize for the best model of "Milo of Croton Destroyed by the Lions." In 1783 he studied in Paris under Pajou, and soon afterwards went to Rome, where he remained until 1790. At Rome he met Goethe, Herder, and Canova. The latter befriended him, and gave him instruction in sculpture. Here he executed his first marble statues, of "Ceres" and "Bacchus." On his return to Germany he was appointed professor of sculpture in the Academy of Stuttgart, and remained in that city until his death, on the 8th of December, 1841. Dannecker was undoubtedly one of the greatest of modern sculptors. His art is midway between that of Canova and Thorwaldsen, and his forte lies in expressing individual characteristics. This gives great value to his busts, among the best of which are those of Schiller at Weimar, of La-

vater in the Public Library of Zurich, and of the Kings Frederick and William of Württemberg. His perceptions of the beautiful and delicate, especially in the female form, are sometimes considered more exquisite and true than those of Canova himself. His earlier works are chiefly pagan in subjects, while his later ones are Christian, and are pervaded by a sensitive idealism. Among the former are his "Sappho," "Psyche," and his best-known work, the "Ariadne," in Frankfort—a figure larger than life, reclining on the back of a panther. His chief work, however, is his statue of "Christ," completed in 1824, after eight years' study. The original statue is in a church in Moscow, but the sculptor executed a replica, which is now at Regensburg. Consult: Clement, *Painters, Sculptors, Architects, and Engravers* (Boston, 1889); Radcliffe, *Schools and Masters of Sculpture* (New York, 1894); Grüneisen and Wagner, *Dannecker's Werke in einer Auswahl* (Hamburg, 1841).

DANNENBERG, dän'nēn-bēr'k. HERMANN (1824—). A German numismatist, born in Berlin. He became president of the Numismatic Society in that city, and is an authority on mediæval coins, on which subject he published the standard work entitled *Die deutschen Münzen der sächsischen und fränkischen Kaiserzeit* (3 vols., 1876-98).

DANNEVIRKE, dän'ne-vēr'ke (Dan., Danes' work). A wall or intrenchment, built by the Danes under King Goetrik in the time of Charles the Great, and enlarged by Queen Thyra in the tenth century. The Dannevirke extended from the Schlei to the Treene, a distance of ten miles, and protected the Danes from the incursions of the Saxons and Wends. In 974 Otho II. vainly endeavored to take the Dannevirke. Later, however, he burned and destroyed a part of it. Waldemar the Great rebuilt a section with brick and stone, in 1080. During the Schleswig-Holstein wars the Dannevirke fell into the hands of the Prussians, April 23, 1848, and was stormed by the Austrians and Prussians in 1864. It has since been leveled.

DAN RIVER. A river rising in the Blue Ridge Mountains (q.v.), in Patrick County, Va., and flowing southeast into North Carolina. After crossing and recrossing the boundary between these States five times, it combines with the Staunton River in southern Virginia to form the Roanoke River (q.v.) (Map: North Carolina, C 1). It is 180 miles long, drains an area of 3700 square miles, and is navigable as far as 60 miles above Danville. It furnishes extensive water-power at several points.

DANTAN, dän'tän'. ANTOINE LAURENT (1798-1878). A French sculptor, born at Saint Cloud. He was a pupil of his father, a wood-carver, and of Bosio. Having won the *grand prix* in 1826, he continued his studies in Rome, and after his return acquired reputation by a considerable number of ideal statues and of eminently characteristic portrait busts of celebrated persons, such as Beethoven, Rossini, and the actress Rachel. Especially noteworthy among his works are: "Young Bather Playing with His Dog" (1835); "Neapolitan Tambourine Girl" (1838); "Allegorical Figure of Asia"; "Colossal Statue of Saint Raphael": the statues of Admiral

Duquesne, at Dieppe, and of the mathematician Laplace at Caen.

DANTAN, JEAN PIERRE (1800-69). A French sculptor, born in Paris. He was a pupil of Bosio, and won the *prix de Rome* in sculpture. He executed busts of Spontini, Bellini, Rossini, and Verdi, a bronze statue of Boieldien (Rouen), and busts of Victor Hugo and Marshal Canrobert. But he is better known for his caricature statuettes of notabilities of the time.

DANTAN, JOSEPH EDOUARD (1848—). A French painter, born in Paris, son of the sculptor Jean Pierre Dantan. He studied in his native city under Pils and Lehman. His remarkable studies in still life, such as the exquisite, soberly painted "Corner of an Atelier" (1880), in the Luxembourg, and "An Interior at Villerville" (1883), are better known than his more conventional religious and historical works, among which are: "The Trinity"; "An Episode in the Destruction of Pompeii" (1869); and "The Vocation of the Apostles Peter and Andrew" (1877). In still another, more pictorial manner, he painted "The Burial of a Child at Villerville," in the Havre Museum.

DANTE ALIGHIERI, Ital. pron. dän'tá ä'lé-gyà'rè (1265-1321). One of the greatest poets of all times, and incomparably the greatest among the Italians. He was born in Florence in the latter part of May, 1265, and his name was originally Durante. The outward circumstances and fortunes of Dante's life are largely involved in uncertainty, and recent critical researches have tended rather to destroy long-accepted beliefs than to add new and reliable details. Rome, Ferrara, Parma, and Verona in turn claimed the origin of his family, which was not necessarily of ancient lineage, although Dante himself seems to have believed that he sprang from Roman stock and to have prided himself upon his noble blood. The first appearance, however, of the Alighieri in history was in 1147, when Cacciaguada, the poet's great-great-grandfather, fell in the Crusades. Alighiero, Dante's father, may or may not have been a jurist, but it is certain that he was an adherent of the Guelph faction. Of his mother nothing is known except that her name was Bella. There is reason to suppose that she died soon after his birth, that his father soon married again, and, dying in 1275, left him with a step-mother, a brother, and two sisters. Of Dante's boyhood and education we know little beyond his own statement that he had 'taught himself the art of bringing words into verse.' It is not surely known that he was ever a pupil of the learned Florentine Brunetto Latini, though he undoubtedly profited from the latter's precepts and example. It is equally questionable whether he ever pursued legal studies at the University of Bologna. We are better informed regarding the social influences under which he grew up in Florence. Among his friends and intimates were the poets Guido Cavalcanti and Cino da Pistoia, who was also a jurist of note; Dino Frescobaldi and Lapo Gianni, both famed for their finished verse; the musician Casella, and the artist Giotto. The most significant event, however, of Dante's early youth, and the one fraught with most enduring consequences, was his meeting with the Beatrice afterwards celebrated in his poems, and believed, upon the authority of Boccaccio, to have been the daughter

of Folco Portinari, who later became the wife of Simone de' Bardi. As related in that unique and earliest of the poet's productions, the *Vita Nuova*, he met her first at a family festival when he himself was but nine years old, and she some months younger. Yet from that moment his love for her seems to have been the dominant influence in his life. There seems to be no good reason for questioning, as some have questioned, whether, after all, Beatrice was a real personality, or whether she was not the creation of a poet's mind, a mere personification of philosophy. It is difficult to read the *Vita Nuova* and still question the truth of what it narrates; from first to last it bears the striking stamp of sincerity. Yet it must be borne in mind that his love for Beatrice was very different from what is ordinarily understood by the term. It was the highest form of spiritual love, freed from the dross of all earthly desires and vulgar jealousy. In Beatrice he saw something more than a woman: from first to last, she was in his eyes an 'angiola gentilissima.'

Beatrice died June 9, 1290, a date that marks an epoch in Dante's life. We know not who was the *donna gentile* to whom a year later he turned for spiritual sympathy, though some have chosen to see in this unknown comforter the Gemma Donati, whom by the persuasion of his friends he was soon after led to marry. Two sons, a daughter Antonia, and perhaps another, Beatrice, were the fruit of this union, which there is no positive reason for believing an unhappy one. Dante maintained an unbroken silence regarding his wife, who continued to live in Florence after his exile, and presumably they never met again.

Of Dante's part in the public affairs of his city a few meagre details are preserved, enough to show that his interest gradually deepened after the death of Beatrice. Too much importance has sometimes been attached to the so-called heroism of his military service. In point of fact, he was simply discharging the duties incumbent upon a citizen of the commune when, in 1289, he took part in an invasion of the territory of Arezzo and was present at the taking of the fortress of Caprona, shortly afterwards. After 1295 his voice was heard with growing frequency in municipal affairs, until the summer of 1300, when he was chosen as one of the six Priors of the city. Though his duties lasted but two months, the time was long enough, as he himself said, to effect his undoing. The Guelphs at this time had become divided into two factions—the *Neri*, led by Corso Donati, and supporters of the Papal power; and the *Bianchi* or moderate Guelphs, who leaned toward the ideas of the Ghibellines. Dante had allied himself with the latter faction, but during his tenure of office party feeling ran so high that the Priors decided upon the extreme measure of banishing the leaders of both factions, and Dante advocated the measure, though Donati, a relative of his wife, was among the banished *Neri*, and Cavalcanti, his friend, among the *Bianchi*. But soon afterwards the *Bianchi* were unwisely allowed to return, and, fearing that their party would get the upper hand in the city, Boniface VIII. sent Charles of Valois to Florence, who quickly restored the *Neri* to power. In 1302 there followed a wholesale banishment of the *Bianchi*, among them Dante, charged with barratry, extortion, corruption, and conspiracy against Boniface, Charles, and the Guelph party.

The exiled *Bianchi* joined forces with the many Ghibellines then living in banishment, and made many attempts to return by force of arms. Just how long Dante remained with his fellow exiles is not known, but sooner or later he wearied of their dissensions, and found an asylum with Bartolommeo della Scala, at Verona. Through the years of wandering that followed, it is idle to attempt to trace him—'a ship without sail or helm,' he calls himself in the *Convivio*. In 1306 we find him at Padua; in 1307 at Casentino, and the following year perhaps at Forlì; 1309 is the date assigned for his alleged visit to Paris, and some would have it that he even pushed on to Oxford, but this cannot be proved. At all events, in 1313 he was in Pisa, where Petrarch saw him as a child. Two years later the Florentines passed a decree allowing the exiles to return, but upon such humiliating conditions that Dante rejected them with scorn. In 1317 he made his permanent home at Ravenna, where he was warmly welcomed by Guido Novello da Polenta, the lord of the city and nephew, it is thought, of Francesca da Rimini. Here he passed his last years, busied with the completion of his great epic, and surrounded by his children and friends, and here he died on the night of September 14, 1321, having been taken ill while on a political mission in behalf of Novello and the city that had given him refuge. He was buried by Novello with great honor, but the latter was expelled from Ravenna before he had time to raise a fitting monument to his friend. Florence, which sought to make tardy atonement by raising a memorial tablet in the Church of Santa Croce, tried in vain to obtain the custody of his remains. For fear of theft, they were hidden, and their resting-place remained a secret down to 1865, since which time they have been jealously guarded by Ravenna.

The chronological order of Dante's writings has been the ground of endless debate. The order which affords the least ground for objections is probably the following: *Vita Nuova*, *De Vulgari Eloquentia*, *Convivio*, *De Monarchia*, the *Rime* and *Epistole*, which cover a long period of years; the *Ecloga*, and the *Commedia*. The *Vita Nuova* probably dates from the early nineties, is written in mingled prose and verse, and contains the story of his love for Beatrice, together with the poems addressed to her and some other ladies. Aside from its lofty sentiment and poetic charm, the *Vita Nuova* possesses a deep interest as being the earliest example of polished Italian prose. The *Convivio*, or Banquet, is also a combination of prose and poetry, in which, as has been quaintly said, the poems are served up as the viands, the commentary as the accompanying bread. Here, also, Beatrice is the central figure, but this time as a sort of personification of divine philosophy. As originally planned, the *Convivio* should have contained fourteen canzoni, with accompanying comment, but in the form in which we have it, it is incomplete. The *Rime* or *Canzoniere* are a collection of poems on many subjects, and obviously covering a long period of years. Among them are four canzoni which relate to a brief attachment felt by Dante for an unknown woman, whom he designates as La Pietra, and whom some would identify with the *donna gentile* of the *Vita Nuova*. The *De Vulgari Eloquentia* is the most interesting of Dante's Latin writings, and may be defined as the first



DANTE
FROM A PORTRAIT BY GIOTTO, IN THE NATIONAL GALLERY, FLORENCE

attempt at a scientific treatise of the Italian language. Dante recognizes the kinship of the Romance languages, but errs rather curiously in declaring Latin an artificial product of later origin. He distinguishes, moreover, fourteen dialects, and condemns them all, including that of Tuscany.

Concerning the poetry, the majesty, the philosophy of Dante's masterpiece, the *Divine Comedy*, whole libraries have been written in praise, in controversy, and in elucidation. The central motive of the epic may be briefly summed up as follows: It depicts a vision, in which the poet is conducted, first by Vergil, the representative of human reason, through hell and purgatory; and then by Beatrice, the representative of revelation, through paradise, and finally by Saint Bernard through the several heavens, where he beholds the triune God. The name *Commedia* was given to the work because, beginning with the horrible, it ends cheerfully, and because in respect to the style it was lowly, being written in the vulgar tongue. The epithet 'Divina' was added by the admiration of after-times. Hell is represented in the poem as a funnel-shaped hollow, formed of gradually contracting circles, the lowest and narrowest of which is at the earth's centre. Purgatory is a mountain rising solitary from the ocean, on that side of the earth that is opposite to us. It is divided into terraces, and its top is the terrestrial paradise, the first abode of man. From this the poet ascends through the seven planetary heavens, the heaven of the fixed stars and the 'primum mobile,' to the empyrean or fixed seat of God. In all parts of the regions thus traversed there arise conversations with noted personages, for the most part those recently deceased, whom Dante had known personally in life. Incidentally, the deepest questions of mediæval philosophy are discussed and solved, and the social and moral conditions of Italy, with the corruption of Church and State, are depicted with noble indignation.

Fifty-two years after the poet's death the Republic of Florence set apart an annual sum for public lectures to explain the *Divine Comedy* to the people, and Boccaccio himself was appointed first lecturer. The example was imitated in several other cities of Italy. The works of these men are among the earliest commentaries on Dante that we possess. Since 1472 there have appeared nearly 500 editions of the *Divine Comedy* in Italian, and the number is being augmented at the rate of at least six a year. Of the notable early editions may be mentioned the following, the earliest of all: Fuligno (1472); the Nidobeatine (Milan, 1477-78); the first Florentine (1481); the first Aldine (1502); the first Cruscan edition (1595); that of Volpi (1727); and of Venturi (1732). Of the countless modern editions, with commentaries, that of Fraticelli (1852) is probably as good as any. The chief English translations are: Boyd's (1785); Cary's (1814); Wright's (1833); Pollock's (1854); Longfellow's (1867); Norton's (1891-92).

BIBLIOGRAPHY. Bartoli, *Storia della letteratura italiana*, vols. iv., v., vi. (Florence, 1881-89); Gaspary, *Geschichte der italienischen Literatur*, vol. i. (Strassburg, 1885): "The Earliest Lives of Dante," trans. from the Italian of Boccaccio and Bruni, in *Yale Studies in English*, No. 10 (New York, 1901); Villani, *Cronica* (Triest,

1857); Pelli, *Memorie per servire alla vita di Dante* (Florence, 1823); Balbo, *Vita di Dante* (Turin, 1839), trans. by Burnbury, *The Life and Times of Dante* (London, 1852); Fraticelli, *Storia della vita di Dante* (Florence, 1861); Blanc, "Dante Alighieri nach seinem Leben und literarischen Werk geschildert," in Ersch and Gruber, *Allgemeine Encyclopädie*, vol. xxiii. (Leipzig, 1832); Wegele, *Dante Alighieris Leben und Werke in Zusammenhange dargestellt* (Jena, 1879); Scartazzini, *Dante Alighieri, seine Zeit, sein Leben und seine Werke* (Frankfort, 1879); Kraus, *Dante, sein Leben und sein Werk* (Berlin, 1897); Federn, *Dante and His Times*, Eng. trans. (New York, 1902); Botta, *Introduction to the Study of Dante*, being a new edition of the author's *Dante as Philosopher, Patriot, and Poet* (London, 1887); Rossetti, *A Shadow of Dante* (London, 1884); Scartazzini, *A Handbook to Dante*, trans. by Davidson (Boston, 1887); id., *A Companion to Dante*, trans. by Butler (London, 1893); Moore, *Textual Criticism of the Divina Commedia* (Cambridge, 1889); *Tutte le Opere di Dante Alighieri* (Oxford, 1894); id., *Studies in Dante* (Oxford, 1896-99); Butler, *Dante, His Times and His Work* (London, 1895); Symonds, *Introduction to the Study of Dante* (Edinburgh, 1890); Witte, *Essays on Dante*, selected, trans. and edited by Lawrence and Wicksteed (Boston, 1898); Lowell, *Among My Books*, 2d series (Boston, 1880); Macaulay, *Essays*, vol. i.; Carlyle, *Heroes and Hero-worship*; Church, *Dante and Other Essays* (London, 1890); Tozer, *An English Commentary on Dante's Divina Commedia* (Oxford, 1901); Scartazzini, *Dante in Germania* (Milan, 1881-83), which contains a complete catalogue of all German publications on Dante; id., *Enciclopedia Dantesca* (Milan, 1896-99).

DANTÉS, dän'tás', EDMOND. The Count in Dumas's romance *The Count of Monte Cristo*. In the pursuit of vengeance, he adopts the aliases of 'Lord Wilmore' and 'Abbé Busoni.'

DANTIER, dän'tyá', HENRI ALPHONSE (1810—). A French author, born at Noyon. His books include a number of valuable histories, particularly of the Benedictines, such as *Etudes sur les Bénédictins* (1854); *Les monastères Bénédictins d'Italie*; and *Les femmes dans la société chrétienne* (1878). The latter was crowned by the French Academy.

DANTON, dän'tón', GEORGES JACQUES (1759-94). One of the great popular leaders in the French Revolution. He was born October 28, 1759, at Arcis-sur-Aube, of a bourgeois family. Though his parents wished him to become a priest, Danton preferred the law, and, after being educated in his native town and at Troyes, he went to Paris. A born orator, Danton quickly rose in his profession, and as early as 1785 he was known as a successful practitioner before the Parlement of Paris. In 1787 he married, and purchased, at a cost of 80,000 livres, a position as advocate of the Royal Council, and was soon earning an income of 25,000 livres a year. At this time he is described as a forcible and eloquent speaker, a man of liberal tastes, fond of books, and happy in his domestic life. He saw the Revolution approaching, and as early as 1787 said to his patron, M. de Barentin, "Moderate reforms are no longer possible; do you not see the avalanche soon to descend?" It is said

that Mirabeau, perceiving Danton's genius, sought to attach him to himself. In the early revolutionary outbreaks Danton took no prominent part, but early in 1790 he was threatened with arrest for protesting in violent terms against Marat's arrest, and in June of the same year he appears as one of the chief founders of the club of the Cordeliers, or ultra-Jacobins, while in the autumn he was chosen to be commander of the National Guard of his district. The next year he appeared as the advocate of the extremists of Paris, and publicly attacked the anti-revolutionary leaders. His utterances having exposed him to arrest, he fled to England and remained there some six weeks, during which time he had conferences with the chief leaders of the Whig opposition. On returning to Paris he was elected to office in the commune, and probably was largely instrumental in inciting and bringing to a successful issue the insurrection of August 9 and 10, 1792. After the taking of the Tuileries and the suspension of the royal power, Danton became Minister of Justice, and in this capacity entered the Provisional Government and became a member of the Executive.

The strongest personality of them all Danton at once assumed the leadership. He took active measures to free the country of its foreign invaders. His eloquence thrilled the people, and when, on September 2d, he made his wonderful speech before the Assembly, and cried: "*Pour les vaincre, pour les atterrir, que faut-il? De l'audace, encore de l'audace, et toujours de l'audace*" ("to vanquish them, to crush them down, what is necessary? To dare, to dare again, and always to dare"). France responded by placing fourteen armies in the field. In October, 1792, partly by force and partly by diplomacy, the foes had been expelled. In the fearful days of the September massacres, when political prisoners were taken out and butchered by hundreds, Danton would not let the Government leave Paris. Of the atrocities that took place he was not actively guilty, though Marat was, but as a revolutionist he acquiesced in and condoned the deeds of his associates. In September, 1792, he resigned as Minister of Justice, and was elected to the Convention. There he successfully repelled a venomous attack made on him by the Girondists, and, later, on his return from his mission to Dumouriez, answered Marat's insinuations that he had been privy to the treachery of that General. Danton was among those who voted for the death of the King (January, 1793). After being elected president of the Jacobin Club, Danton, in March, 1793, became a member of the Committee of Public Safety, and later its president. This was the period of his greatest services to France, when he organized her defenses and directed her foreign policy. The irreconcilable attitude of the Girondists forced him to take active measures for their suppression (June 2, 1793), for he felt that they were not true revolutionists. In his revolutionary enthusiasm, however, Danton called up a force that was destined to crush him. After the fall of the Girondists, he advocated the formation of a new and more powerful Committee of Public Safety, endowed with unlimited authority and ample resources. He himself ceded his right to a seat on this tribunal, an error of judgment which cost him his life. Danton's aim at this time was undoubtedly the conciliation of the various republican and revolu-

tionary factions in France into a stable and peaceful government; the aim of the committee was to make its own power supreme over all others. Robespierre began to emerge as its leader, supported by Saint Just, Billaud-Varennes, and Couthon. While Danton, with his friend and ally, Camille Desmoulins (q.v.), the inspirer and chief author of the Vieux Cordelier papers, were advocating moderation, the followers of Robespierre were preparing to strike. The first of their opponents to fall were the fanatical Hébertists, in March, 1794; after them came the turn of the Dantonists. Their leader seemed no longer to care for the turmoil of politics, but pursued a policy of inaction and awaited the attack. For a short time Danton retired to his home at Arcis-sur-Aube, having recently married a second wife. His enemies were active, and, after some show of hesitation, Robespierre yielded to Billaud-Varennes (q.v.) and the fate of the Dantonists was sealed. On March 30, 1794, Danton, Camille Desmoulins, and others of the party were seized and imprisoned.

Before the revolutionary tribunal, the strength of Danton's character shone forth. Questioned by the president as to his name and dwelling, he replied: "My name? It is Danton: a name tolerably well known in the Revolution. My dwelling? It will soon be annihilation; but my name will live in the pantheon of history." His trial was a farce, the formal charge being that of conspiring to restore the monarchy. The eloquence of the man was so great that Paris thrilled as he hurled defiance at his accusers, and there was danger of a popular revolt in his favor. The Convention eagerly seized on the infamous suggestion of Saint Just, that disrespect for justice merited summary conviction, and, with fourteen of his supporters, Danton was at once condemned to the guillotine. Almost his last words were inspired by the treachery of Robespierre. "I could have saved him," he said; "I leave it all in a frightful welter; not a man of them has any idea of government. Robespierre will follow me; he is dragged down by me." On April 5, 1794, Danton mounted the scaffold with calm courage. A moment he stood erect, facing the mob, then, turning to the executioner, knelt, and, laying his head on the block, said, "Show the people my head; it is worth seeing." The accusations of venality, of dissolute conduct, of blood-thirsty ferociousness, so often made against Danton, have been long since disproved. "The Mirabeau of the *sansculottes*," says M. Claretie, "was a bourgeois Mirabeau, equally powerful, but neither dissolute nor venal."

BIBLIOGRAPHY. Following the lead of Comte, the French Positivists have sought with considerable success to redeem the reputation of Danton, and to establish his claim to rank as a patriot. The biographies of him that are of any value represent this tendency. His chief biographer has been Dr. Robinet, whose studies are supported by an ample array of documents and *pièces justificatives*. These are: *Danton, mémoire sur la vie privée* (Paris, 1865); *Le procès des Dantonistes—documents avec introduction historique* (Paris, 1879); *Danton émigré, recherches sur la diplomatie de la République, 1793* (Paris, 1887); and *Danton, homme d'état* (Paris, 1889), the most important of the series, published on the revolutionary centenary. All recent writers

have relied largely upon the researches of Robinet. Other important works are: Bougeart, *Danton* (Paris, 1861); Dubost, *Danton et la politique contemporaine* (Paris, 1880), a study of Danton's influence on French republicanism, which the author regards as permanent, and *Danton et les massacres de Septembre* (Paris, 1886); and Beesly, *Life of Danton* (London, 1889). Belloc, *Danton: A Study* (London, 1899), is a well-written book by a strong admirer. Danton's works have been collected and edited by Vermorel, *Œuvres de Danton* (Paris, 1886). An admirable selection of significant extracts from his important speeches will be found, preceded by a useful introduction, in H. Morse-Stephens, *Orators of the French Revolution* (Oxford, 1892). Consult, also: Aulard, *Notes sur l'éloquence de Danton* (Paris, 1882); *Les orateurs de la Législative et de la Convention* (Paris, 1885-86); and *Les grands Français* (Paris, 1887); Gronlund, *Ça ira! or, Danton in the French Revolution* (Boston, 1888), is a tractate from the Socialist point of view.

D'ANTRAIQUES, dän'tràg'. See ANTRAIQUES.

DANTZIC, dän'tsík. See DANZIG.

DAN'UBE (Ger. *Donau*, Hung. *Duna*, Lat. *Danuvius*, OChurch Slav. *Dunavü*, *Dunay*; connected with OHG. *tuonaouca*, foreign). The second of European rivers, inferior only to the Volga. It has its origin in the Brege and Brigach, two mountain streams rising in the eastern part of the Black Forest, in Baden, at an elevation of 2850 feet above sea-level, in latitude 48° 6' N., and in longitude 8° 9' E. (Map: Europe, E 4). The total length of the Danube is about 1800 miles. The area which it drains is estimated at about 300,000 square miles, comprising countries differing widely in climate and productions, including southern Germany, a great part of Austria-Hungary, Bosnia, Servia, Bulgaria, and Rumania. The Danube is joined in its course by sixty navigable rivers, whose waters, with those of many lesser streams, it conveys into the Black Sea. From its source it flows in an easterly and then in a northeasterly direction through Baden, Hohenzollern, Württemberg, and Bavaria. Passing Ulm, near which it receives the Iller, and at which point the river becomes navigable for small steamboats, it receives from the south the Lech and flows past Ingolstadt and Regensburg (Ratisbon), between which two towns it is joined by the Altmühl from the left; then, altering its course to the southeast, it receives the waters of the Isar and the Inn from the south, the latter joining it at Passau. It then traverses Upper and Lower Austria from west to east, passing Linz and Vienna, and about 40 miles beyond the latter city it enters Hungary near the town of Pressburg. Between Passau and Pressburg it receives from the south the Enns, and from the north the March, in a country rich in minerals, well peopled, and highly cultivated. Below Pressburg it divides, inclosing the low-lying islands called the Great and Little Schütt. Between Pressburg and Budapest, in which part of its course it passes the famous fortress of Komorn and the town of Gran (Esztergom), it receives from the north the Waag, the Neutra, the Gran, and the Eipel, and from the south the Raab. A few miles above Budapest it turns directly south and enters the great Hungarian plain, in which it

is continually forcing new channels and silting up old ones, sometimes sweeping away towns, or capriciously removing its channel to a distance of several miles from those formerly upon its banks. Here it receives from the west the Drave. After this the river turns toward the southeast, and, joined by the waters of the Theiss from the north and the Save from the west, sweeps past Belgrade, forming the boundary between Servia and Hungary, and receiving the Morava from the south. From Belgrade to Orsova, where it reaches the borders of Wallachia, the Danube pursues an easterly course.

Leaving Orsova, the Danube passes the famous 'Iron Gate,' where the river formerly rushed over a broad plateau of rock 1460 yards wide. This rapid, which was followed by a series of whirlpools, eddies, and shallow falls, formed an effectual bar to the upward progress of vessels, no craft drawing more than two and one-half feet of water being able to pass it. In 1847-49, however, the obstruction formed by the 'Iron Gate' was to some extent removed by blasting, and since then further improvements have been made in this part of the course, the Austrian Government in 1890 having begun works for making the river constantly navigable at this point. The new passage was formally opened September 27, 1896. For a short distance below this the river flows south between Wallachia and Servia, and then, turning eastward, traverses a vast plain, in which it forms the boundary between Wallachia and Bulgaria. From the Carpathians it receives the Sibil and the Aluta and Veda, and from the Balkan Mountains the Isker, the Osma, and the Yantra. Increased by these rivers and by numerous lesser streams, it progresses through a poorly cultivated and thinly peopled but fertile district, occasionally broadening like a sea, as at Hirsova, and encircling many islands. After being joined by the Sereth and the Pruth from the north, and about 50 miles from the Black Sea, it divides into several branches, forming a great delta with an area of about 4000 square miles. The principal channel-mouth is the Sulina, through which the greater number of ships pass. This has been deepened by means of jetties, so as to admit vessels of 20 feet draught. The other principal mouths are the Kilia and Saint George, which, although useless for navigation, discharge a large proportion of the water. The Danube is the chief natural highway for central European commerce. Communication has been established between it and the Rhine by the construction of the Ludwigs-Kanal, in Bavaria, connecting the Altmühl with the Regnitz, an affluent of the Main. At the Peace of Paris in 1856 the navigation of the Danube was declared free to all nations, and its management was intrusted to two commissions, one representing the European Powers, another named by the States on the banks of the river. At the Berlin Congress of 1878 it was stipulated that no ships of war should navigate the Danube below the 'Iron Gate.' Within the last thirty years the Austrian Government has executed great works for the improvement of the navigation of the river at Vienna, and for the regulation of its flow, so as to avert disastrous inundations. The Danube Steam Navigation Company has done much to increase the commerce.

DANUBIAN PRINCIPALITIES. See MOLDAVIA; WALLACHIA; RUMANIA.

DANVERS. A town, including several villages, in Essex County, Mass., four miles northwest of Salem; on the Boston and Maine Railroad (Map: Massachusetts, F 2). It contains Saint John's Normal College (Roman Catholic); the Danvers Insane Hospital, a State institution; Peabody Institute Public Library of about 17,000 volumes; and Danvers Historical Society. The manufactures include shoes, leather, morocco, brick, motor vehicles, electric lamps, iron, rubber, soap, etc. The government is administered by town meetings. Population, in 1890, 7454; in 1900, 8542.

Until 1752, when it was incorporated as a separate town, Danvers was part of Salem. Here the witchcraft delusion of 1692 first appeared, and ten of the inhabitants within this district were convicted and hanged, many more being arrested and acquitted. Consult: Handson, *History of the Town of Danvers* (Danvers, 1848), and Hurd, *History of Essex County* (Philadelphia, 1888).

DANVILLE, dän'völ'. See ANVILLE.

DANVILLE. A city and county-seat of Vermilion County, Ill., 125 miles south of Chicago; on the Vermilion River, and on the Wabash, the Chicago and Eastern Illinois, and the Cleveland, Cincinnati, Chicago and Saint Louis railroads (Map: Illinois, E 3). It has coal-mining interests, foundries, and manufactures of woollen goods, glass, and bricks. Among the points of interest may be noted the Danville Branch National Soldiers' Home, Carnegie Public Library, Government building, Railroad Y. M. C. A. building, and three fine parks—Lincoln, Douglas, and Ellsworth. Settled about 1830, Danville was incorporated in 1867. It is governed by a mayor, elected biennially, and a city council which selects the city engineer and confirms the executive's appointments to the police and fire departments and public library board. Other administrative officials are chosen by popular election. Population, in 1890, 11,491; in 1900, 16,354.

DANVILLE. A town and the county-seat of Hendricks County, Ind., 20 miles west of Indianapolis; on the Cleveland, Cincinnati, Chicago and Saint Louis Railroad (Map: Indiana, C 3). It contains the Central Normal College, which has a library of 2500 volumes, and manufactures flour, lumber products, etc. Population, in 1890, 1569; in 1900, 1802.

DANVILLE. A city and county-seat of Boyle County, Ky., 84 miles southeast of Louisville; on the Cincinnati Southern Railroad (Map: Kentucky, G 3). It is in a stock-raising and agricultural region, the principal products of which are hemp, corn, wheat, tobacco, and fruit. The city is the seat of the Kentucky Institution for Deaf Mutes, and of several Presbyterian institutions: Centre College, founded in 1819; Danville Theological Seminary, founded in 1853; and Caldwell College for women, founded in 1860. It has a park named in honor of Dr. Ephraim McDowell. It is governed by a mayor, elected every four years, and a unicameral city council. The water-works are owned and operated by the city. Here in 1785, 1786, 1787, and 1792 important conventions were held, the first State Constitution for Kentucky being drawn up

in 1792. Danville was the birthplace and early home of James G. Birney and the home of Joshua F. Bell. The settlement was first incorporated in 1789. Population, in 1890, 3766; in 1900, 4285.

DANVILLE. A borough and county-seat of Moutour County, Pa., on the north branch of the Susquehanna River, 12 miles from its intersection with the West Branch, and on the Pennsylvania, the Laekawanna, and the Philadelphia and Reading railroads (Map: Pennsylvania, E 3). It contains a public library and is the seat of a State hospital for the insane. There are deposits of coal, limestone, and iron ore in the vicinity, and the borough has several extensive blast-furnaces, rolling-mills, stove-works, etc. The government is vested in a burgess, elected every three years, and a borough council. The water-works are owned and operated by the municipality. Population, in 1890, 7998; in 1900, 8042.

DANVILLE. A city in Pittsylvania County, Va., 141 miles southwest of Richmond; on the Dan River and on railroads of the Southern Railway System (Map: Virginia, E 5). Located in the Piedmont section of Virginia, amid picturesque mountain scenery, Danville rises from the river, which furnishes splendid water-power, to an altitude of from four to six hundred feet above tide. Its streets are well shaded, and the climate is mild and healthful. The surrounding region is adapted to the cultivation of tobacco, grain, fruits, and other produce. The city is the seat of Roanoke Female College (Baptist), established in 1859; Randolph Macon Institute (Methodist) for Young Ladies, founded 1883; and Danville Military Institute, organized in 1890. Danville has an extensive tobacco trade, and many tobacco warehouses and factories, a cheroot factory, cotton-mills, furniture factory, fertilizer factory, knitting-mills, and pants and overall factory. The government is administered, under the charter of 1890, by a mayor, chosen for two years, and a city council which controls the appointments to the important administrative offices; the sergeant, attorney, treasurer, and the clerk of the court being elected by the people. The water-works and electric-light and gas plants are all owned and operated by the city. Danville was incorporated as a town in 1792. It was for a short time the seat of government of the Southern Confederacy during its last days. Population, in 1890, 10,305; in 1900, 16,520.

DANZIG, dän'tsik, in English commonly written DANZIC (Pol. *Gdansk*, Lat. *Gedanum*). An important seaport, manufacturing centre, and fortress, chief town of the Province of West Prussia, on the left bank of the western branch of the Vistula, about three miles from its mouth in the Baltic, and about 300 miles northeast of Berlin (Map: Prussia, II 1). Danzig is surrounded by a moat and ramparts strengthened by twenty bastions and is further fortified by several detached forts on the west and a chain of works extending north along the Vistula to the fort at its mouth at the suburb of Neufahrwasser. In addition, the garrison possesses the means of laying the surrounding country under water on three sides. The city is traversed by the Mottlau and Radaune, tributaries of the Vistula. The former, which flows through the

city in two branches, divides the older sections of the Altstadt, Rechtstadt, and Vorstadt from the newer Niederstadt and Langgarten. The Radaune, which enters the town through an artificial channel, separates the Altstadt from the Rechtstadt. Between the two branches of the Mottlau is the Speicherinsel, an island on which enormous granaries have been erected for the accommodation of the vast stores of grain exported from Danzig. The rivers and canals are crossed by about fifty bridges. The Lange Brücke, a quay extending along the bank of the Mottlau, opposite the island, is one of the picturesque sights of the town. The city is generally very mediæval in aspect, successive old styles of its buildings having been well preserved, including in the residences the countless gable façades and a peculiar feature known as *Beischläge*—elevated, open-air landings. Many of the streets of Danzig are narrow and crooked, but the principal streets, Langgasse and Lange Markt, intersecting it from east to west, abound in fine specimens of antique architecture, and have a most picturesque appearance. Among the most noteworthy buildings are the Church of Saint Mary, a fine structure, commenced in 1343, but not finished until 1503, and containing, besides a fine high altar by Michael and other interesting objects of art, a celebrated picture of the "Last Judgment," generally attributed to Memling; the Church of Saint Catharine; Trinity Church; the fine old Rathaus, dating from the fourteenth century; the Artushof—or Junkerhof—the former merchants' guild, now used as an exchange; and the old Franciscan monastery containing the municipal museum.

Danzig is the seat of the provincial government and of a provincial court. The city's affairs are administered by a municipal council of 60 and an executive board of 21 members. It has exhibited an enterprising spirit in the matter of municipal undertakings. It has excellently organized fire and street-cleaning departments. Two large aqueducts supply it with water, and a modern system of sewers connected with sewage farms on the Baltic gives the town a satisfactory drainage. It has, however, a rather high death rate, exceeding 24 per thousand. The municipality maintains gas-works, an electric-light plant, slaughter-houses, and a market-hall. Danzig is well provided with educational institutions, which include two gymnasias, of which only one is maintained by the city, two high schools, a navigation school, military school, industrial trade and music schools, and a municipal library and theatre. Its charitable institutions include two municipal hospitals, as well as numerous other institutions.

Danzig has advantageous connections by rail, river, and sea. It maintains a large trade in lumber and grain, serving as a clearing place for the agricultural products of eastern Prussia and the whole of the Vistula region, which embraces a considerable part of Russian Poland. The value of the sea trade alone, which constitutes less than one-half of the total trade of the city, exceeds \$50,000,000 a year, the imports having almost doubled in value in the decade of 1888-98. They include coal, iron, petroleum, machinery, spices, and other agricultural products of tropical countries; whereas the exports, as already stated, consist almost entirely of lumber, grain, and a few other agricultural prod-

ucts. The growth of Danzig's sea trade has been interfered with by the competition of Stettin and of the Russian ports on the Baltic, and it is losing its relative importance as a port. The manufactures of Danzig are developing rapidly. There are large ship-building yards, breweries, distilleries, and factories for the production of firearms, machinery, and other iron-ware, paper, glass, soap and candles, flour, etc. Danzig is the seat of a United States consular agency. Population, in 1890, 120,000; in 1900, 141,000. The environs are very attractive.

Danzig is mentioned in 997, when Christianity was first preached there. Its possession was contended for by the Danes, Swedes, Pomeranians, and Teutonic knights, of whom the last became masters of the town in 1310. Under their rule Danzig prospered exceedingly; about 1358 it joined the Hanseatic League. In 1466 the town declared itself a free city, under the protection of Poland. The wars of the seventeenth century destroyed its prosperity, and though it was left a free city on the first partition of Poland, in 1772, its trade ceased almost entirely. In 1793 it became Prussian. Taken by the French Marshal Lefebvre (who received the title of Duke of Danzig) in 1807, it was retaken by the Allies in 1814, and restored to Prussia. Consult: Prutz, *Danzig, das nordische Venedig* (Leipzig, 1868); Wistulanus, *Geschichte der Stadt Danzig* (Danzig, 1891); Puttner, *Danzig* (ib., 1899).

DANZIG, DUKE OF. See LEFEBVRE, FRANÇOIS JOSEPH.

DAPHNE, *dāf'nē* (Lat., from Gk. *Δάφνη*, laurel). The personification of the laurel, Apollo's sacred plant. According to the legend, Daphne was a nymph, beloved and pursued by Apollo. On crying to her mother, Earth, for help, she was transformed into a laurel, which Apollo chose as his favorite plant.

DAPHNE. A magnificent grove and sanctuary of Apollo, near Antioch, on the Orontes (q.v.). Like the city, it was founded by Seleucus Nicator, who localized here the story of the transformation of the nymph. The Temple of Apollo, containing a statue of the god by Bryaxis, was placed in the midst of a grove of cypress and bay trees, and surrounded by baths, porticos, and gardens. The place had the privilege of asylum, and was also the scene of the 'Olympian games' held at Antioch. The extreme beauty of the surroundings made it a favorite place of resort for the luxurious, and it has been described as a scene of continual vice. With the growth of Christianity the worship of Apollo gradually fell into neglect, and shortly after the attempt by the Emperor Julian (q.v.) to revive its splendors the temple was burned and the site gradually abandoned. The probable site of Daphne is now called Bēt el-Mā, and still shows luxuriant vegetation, though the ancient remains are scanty.

DAPHNE. A genus of plants of the natural order Thymelæaceæ, containing 30 or 40 species of European or Asiatic shrubs or small trees, some of which have deciduous and some evergreen leaves; and all more or less acid in all their parts, which makes some of them even caustic. The berries are poisonous, but the flowers of some are deliciously fragrant. To this genus belongs the *Daphne mezereum*, well known both

for the fragrance of its flowers and for its medicinal uses, naturalized in some places in England and escaped in Canada and the United States. The garou bush (*Daphne gnidium*), a native of the south of Europe, less hardy than the mezereon, has the same medicinal properties. The spurge-laurel (*Daphne laureola*), a native of Great Britain, is an evergreen shrub three to four feet high, with obovate-lanceolate leaves, which grow in tufts at the end of the branches, and give it a remarkable appearance. It grows well under the shade of trees. *Daphne odora*, a species introduced from Japan, has lemon-scented leaves. Of species in cultivation, *Daphne mezereon* is the only one hardy as far north as New York. The evergreen species are as a rule less hardy, though *Daphne encorum* is fairly resistant. (For illustration, see Plate of MOUNTAIN PLANTS.) From the bark of some species of Daphne and of the most nearly allied genera paper is made in different parts of the East, particularly 'Nepal paper,' from that of *Daphne cannabina*. Slips of the inner bark are boiled in a lye of wood ashes for half an hour, till quite soft; are then reduced to a homogeneous pulp by beating with a wooden mallet in a mortar, churned with water into a thin paste, and poured through a coarse sieve upon a cloth stretched on a frame. The paper is subsequently polished by friction, with a shell or a piece of hard wood, and is remarkable for its toughness, smoothness, and durability. Most of the paper used in Tibet is made from the bark of different species of Daphne and allied genera, particularly of *Edgeworthia Gardneri*, a beautiful shrub, with globes of waxy, cow-slip-colored, deliciously fragrant flowers, growing on the Himalaya, at an elevation of 6000 to 7000 feet. The bark of *Lasiosiphon Madagascariensis* is made into paper and ropes in Madagascar.

DAPHNE. The first, strictly speaking, of the Italian operas, produced in 1596, under the auspices of the Society of the Alterati. The score was by Caccini and Peri, and the libretto by Ottavio Rinuccini. When translated by Opitz to the new music of Heinrich Schütz, it became the first German opera as well (1627).

DAPHNEPHORIA, dāf'nē-fō'ri-ā. See GREEK FESTIVALS.

DAPHNIN, dāf'nin (from *Daphne*). $C_{15}H_{18}O + H_2O$. A glucoside found in the *Daphne mezereon* and readily decomposed into sugar and a substance called *daphnetin*, which, like the asculetin obtained from the glucoside *asculin*, has the composition represented by the molecular formula $C_8H_8O_4$. *Daphnetin* has also been prepared artificially.

DAPHNIS, dāf'nīs (Lat., from Gk. *Δάφνις*). A favorite character in the bucolic poetry of the ancients. The first certain appearance of the story in literature is in the early part of the third century B.C., in Timæus and Theocritus. In its earliest form it seems a Sicilian folk-tale. The herdsman Daphnis, son of Hermes and a nymph, was beloved by a nymph, who made him promise never to love a mortal. Under the influence of wine he was seduced by a Sicilian princess; thereupon the nymph punished him with blindness or petrification. The bucolic poets altered the details of this very common folk-tale to suit themselves, and Daphnis became merely a conventional figure. Late writers in-

deed made him the inventor of the Sicilian herdsman's song, which was regarded as the original bucolic poetry. Consult Prescott, "A Study of the Daphnis Myth," in *Harvard Studies in Classical Philology*, vol. x. (Boston, 1899).

DAPHNIS. A modest shepherd in Beaumont and Fletcher's *The Faithful Shepherdess*.

DAPHNIS AND CHLOE, klō'ē (Gk. *Δάφνις καὶ Χλόη*, *Daphnis kai Chloē*). The title of an exquisite Greek pastoral love story by the pseudolongus, dating from the later period of the Roman Empire. It is the source of Tasso's *Aminta*, Bernardin de Saint-Pierre's *Paul et Virginie*, and Ramsay's *Gentle Shepherd*. Almost all these authors knew the story as rendered into French by Amyot (1559). See Loxgus.

DA PONTE, dá pōn'tá, LORENZO (1749-1838). An Italian librettist, born at Ceneda, near Venice, and for many years a resident of New York City. Exiled from Venice for writing a satirical poem, he went to Vienna, where he became one of the secretaries of Joseph II. There he wrote for the stage, among other works, the librettos for Mozart's *Don Giovanni* and *Le Nozze di Figaro*. After the Emperor's death he went to London, where he was secretary and poet of the Italian opera. In 1805 he emigrated to New York, where he taught Italian, and in 1828 was appointed professor of that language in Columbia College. He described his adventurous life in *Memorie* (1823-27), and also wrote sonnets, and translations of English works into Italian.

DAPONTES, dá-pōn'tēs, CONSTANTINOS (? - 1789). A Greek monk and poet. He was attached to the court of the Hospodar of Moldavia, Maurocordatos, and frequently came into conflict with the Mohammedan authorities. He is regarded as the most distinguished of the modern poets of the Greek Church, and several of his works, such as the *Garden of Mercy*, are still read. He died in a monastery on Mount Athos. One of his works has been translated into French by E. Legrand under the title, *Ephemérides Daces, ou chronique de la guerre de quatre ans, 1736-39* (1880).

DAPPLE. In Cervantes's *Don Quixote*, the ass ridden by Sancho Panza.

DAQĪQĪ, dā-kē'kē. The name of a Persian poet, one of the predecessors of Firdausi. See FIRDAUSI; PERSIAN LITERATURE.

DARAB, dā-rāb', or **DARABGHERD**, -gērd' (Pers., city of Darius, from *Dārā*, OPers. *Dārayavansh*, Gk. *Δαρείος*, *Dareios*, Darius + *gird*, OPers. *vardana*, city; connected with Lat. *urbs*, city). A town of Persia in the Province of Farsistan, situated on a small river, about 130 miles southeast of Shiraz (Map: Persia, E 6). It has some tanneries and exports southern fruits, especially dates. In its vicinity is situated a caravansary hewn in rock, and also a relief commemorating the victory of Shahpur over Valerian. The population is estimated at from 4000 to 12,000.

DARBHANGA, dārb-hān'gā. The capital of a district of the same name in the Patna division, Bengal, India (Map: India, E 3). It is situated on the Little Bagmati River, and is an important railway junction, 78 miles north-east of Patna. Its chief building is the maharajah's palace, situated in beautiful gardens, with noteworthy zoölogical sections. It has a large market-place, important bazaars, a hospital, and

a good water-supply from extensive tanks. A considerable trade is carried on in the agricultural and mineral products of the region. Population, in 1891, 73,600; in 1901, 66,000.

D'ARBLAY, dār'blá', FRANCES BURNEY (1752-1840). An English novelist. She was a daughter of Charles Burney, a musician, and was born at King's Lynn, June 13, 1752. Eight years later the Burneys removed to London. At the famous musical assemblies given by her father, Miss Burney saw, from the outside, fashionable life, and this she depicted with spirit and humor in her first novel, *Evelina* (1778). No novel since *Clarissa Harlowe* attracted more notice. It was read by Burke, Reynolds, and Johnson, and lavishly praised. This brilliant success was followed by *Cecilia* (1782), which, though not so fresh as *Evelina*, and a little heavy, had a large sale. In 1786 Miss Burney was appointed second keeper of the robes to Queen Charlotte. Disliking the service, she resigned her position five years later. While visiting her sister at Mickleham, she became acquainted with a French refugee, General d'Arblay, whom she married in 1793. The rest of her life was passed partly in England and partly in France. She published two other novels, *Camilla* (1796) and *The Wanderer* (1814), neither of which is readable. A play of hers, *Edwy and Elvina*, was performed in 1795, and was unsuccessful, though Mrs. Siddons and Kemble took the leading parts. She also published memoirs of her father (1832), written in an affected style resembling her last novels. She died January 6, 1840. In 1842-46 appeared her interesting *Letters and Diaries*, a section of which seems to have been used by Thackeray for his Waterloo scene in *Vanity Fair*. Miss Burney's first two novels mark the beginning of the novel of domestic life, and prepared the way for Maria Edgeworth and Jane Austen. Consult Macaulay, *Essays*.

DARBOUX, dār'bōō', JEAN GASTON (1842—). A French mathematician, born at Nîmes. He studied at the Ecole Normale, was appointed senior professor of geometry in the faculty of sciences there, and in 1887 became dean of that faculty. His *Mémoire sur les solutions singulières des équations aux dérivées partielles* was in 1876 awarded the mathematical grand prize by the Academy of Sciences. His works include *Sur les théorèmes d'Ivory relatifs aux surfaces homofocales du second degré* (1872); *Mémoire sur l'équilibre astatique* (1877); and *Leçons sur la théorie générale des surfaces et les applications géométriques du calcul infinitésimal* (1887).

DARBOY, dār'bwá', GEORGES (1813-71). An ill-fated French prelate, Archbishop of Paris. He was educated at the Seminary of Langres and became professor there in 1840, having been ordained priest in 1836. Preceded by his reputation as translator of Dionysius the Areopagite, he went to Paris in 1845, became almoner of the Collège Henri IV. in the following year and titular vicar of Paris in 1855. He was in high favor at the Court of Napoleon III., was made Bishop of Nancy in 1859, Archbishop of Paris in 1863, and afterwards grand almoner to the Emperor, and Senator. A strenuous upholder of episcopal independence, he stoutly opposed the declaration of the dogma of Papal infallibility at the Vatican Council. When it was declared, he silently submitted, yet in his diocese continued

to disregard Papal interference. Decidedly at variance with the Jesuits, he incurred the displeasure of Pius IX., who persistently declined to confer upon him a cardinal's hat. During the siege of Paris in 1870-71 he was indefatigable in his care for the sick and wounded soldiers and in works of benevolence, and could not be induced to leave his post or to seek safety in flight during the brief and terrible triumph of the Commune. He was seized as a hostage by the Communists, and while the combat raged in the streets of Paris after the entry of the Versailles troops, he was shot in the court of La Roquette Prison, several of his priests and many others sharing his fate. Among his writings are worthy of mention: *Saint Thomas Becket, sa vie et ses lettres* (1860); *Les femmes de la Bible* (8th ed. 1876); *Les saintes femmes* (4th ed. 1877). For his biography, consult Foulon (Paris, 1889).

DARBY, JOHN NELSON. See PLYMOUTH BRETHREN.

DARBY AND JO'AN. The hero and heroine of an eighteenth-century ballad which first appeared in the *Gentleman's Magazine*, March, 1735, under the title *The Joys of Love Never Forget: A Song*. Its author was Henry Woodfall, a London printer. In his youth Woodfall had been apprenticed to the printer John Darby, of Bartholomew Close; and he took Darby and his wife as the subject of this popular song.

DARCEL, dār'sél', ALFRED (1818—). A French archaeologist, born in Rouen. In 1871 he was made director of the Musée Cluny. His works include many articles in the *Gazette des Beaux-Arts* on Mediæval and Renaissance art and architecture. Among his publications are: *Notice des faïences italiennes* (1869); *Les manufactures nationales de tapisserie* (1884); *Catalogue de l'exposition rétrospective de l'art français au Trocadéro* (1889).

DARCEY, dār'sá', JEAN (1725-1801). A French chemist, director of the porcelain works at Sèvres. He was one of the first to manufacture porcelain in France. He devoted himself chiefly to applied chemistry and made valuable contributions to that science. In 1774 he was appointed professor of chemistry in the Collège de France, and in 1795 he became a member of the Institute.

DARCET, JEAN PIERRE JOSEPH (1777-1844). A French industrial chemist, son of Jean Darcet. He introduced important improvements in the manufacture of soap, soda, alum, sulphuric acid, etc., and contributed a number of important papers to the *Annales de chimie et de physique*.

DARDANELLES, dār'dá-nél'z' (named after the Greek city *Dardanus*, on the eastern side; the ancient Hellespont). A narrow channel separating southeast Europe from southwest Asia, and uniting the Sea of Marmora with the Ægean Sea (Map: Turkey in Europe, F 4). It extends from northeast to southwest, between latitudes 40° and 40° 30' N., and longitudes 26° 10' and 26° 40' E., having a length of about 42.3 miles and a breadth varying from 1 to 4 miles. The average depth of the channel is 180 feet. From the Sea of Marmora a strong current runs through the strait to the Grecian Archipelago, except in the presence of a strong southwest wind, but there is an undercurrent in the opposite direction.

The European shores are steep and sterile, while the Asiatic shores are sloping and fertile. To prevent an attack on Constantinople by water from the Ægean, the Dardanelles is strongly fortified on both sides with many guns of large calibre. A treaty concluded between the five great Powers and Turkey in 1841 arranged that no ship of war belonging to any nation save Turkey should pass the Dardanelles without the express consent of Turkey, and all merchant ships were required to show their papers to the Ottoman authorities. These provisions were confirmed at London in 1871 and at Berlin in 1878, but in 1891, by an agreement with the Porte, Russia secured for her 'volunteer fleet' the right of passage through the Dardanelles. The Dardanelles is celebrated in ancient history on account of Xerxes and Alexander having crossed it, the former in B.C. 480, to enter Europe, and the latter in B.C. 334 to enter Asia. The point at which Xerxes crossed was in the neighborhood of Abydos, on the Asiatic shore, opposite to Sestos, where the strait is 6500 feet wide. Alexander crossed at nearly the same place; and here also, in the ancient legend, young Leander nightly swam across to visit Hero—a feat performed in modern times by Lord Byron.

DAR'DANI. In Greek legend, a people living on the Hellespont, adjoining the territory of Ilium. Under the leadership of Æneas they were allies of the Trojans, and were so closely identified with them that their name was often used, particularly by Roman poets, as equivalent to Trojan.

DARDA'NIUS. The servant of Brutus, in Shakespeare's *Julius Cæsar*; he appears only in act v., scene 5, and refuses to let his master run upon his sword.

DAR'DANUS (Lat., from Gk. Δάρδανος). The mythical ruler of the Dardanians (see DAR-DANI), son of Zeus and Electra, the daughter of Atlas. In some legends he is closely connected with Samothrace, and is celebrated as introducing the Samothracian mysteries and the worship of Cybele into Asia Minor. In Roman story he was said to have come to Phrygia from Italy, so that Æneas really returned to the home of his ancestors.

DARDS (Skt. *Darada*, Gk. Δάρδαί, *Dardai*, Δάρδαροι, *Daradrai*, or Δέρδαί, *Derdai*). The natives of what is known as Dardistan, a region of Asia between Kafiristan and Baltistan, to the northwest of Kashmir. The Dards (Dardi, Dardu) belong by language to the Aryan stock. Physically they are of the short-statured dolichocephalic (or mesocephalic) variety of the white race, rather dark-skinned and black-haired, but presenting also a number of taller and lighter individuals. Among the chief divisions of the Dards are the Chins and the Yeshkuns. The religion of the Dards is now Islamism, which only recently has superseded Buddhism among them. Surrounded by Asiatics, these Aryans seem to have preserved some of the primitive social characteristics of their remote ancestors, and in spite of Mongoloid intermixture they have never been completely Orientalized. Since Leitner's *Languages and Races of Dardistan* (1867-73), the more recent literature of the subject includes Biddulph's *Tribes of the Hindoo Koosh* (1880); De Ujfalvy's *Aus dem westlichen*

Himalaya (1884); and Leitner's *Hunza and Nagar Handbook* (1893).

DARE, VIRGINIA (1587- ?). The first child born in America of English parents. She was born at Roanoke, Va. (now North Carolina), and was the granddaughter of John White, who was sent out by Sir Walter Raleigh as Governor of the colony, which, during the founder's absence in England, disappeared without leaving a trace.

DAREDEVIL. A cowardly blasphemer, the hero of Otway's *The Atheist*, who forgets his boastings when in the face of death.

DAR-EL-BEIDA, dār'el-bā'dā, or CASABLANCA (Ar., white house). A seaport on the western coast of Morocco, North Africa (Map: Africa, D 1). It is surrounded by walls and has a deep but unprotected roadstead. It has an extensive foreign trade. Its population is estimated at 25,000, including about 19,000 Arabs and only about 400 Christians.

DARES, dā'rēz (Lat., from Gk. Δάρης). A Trojan priest mentioned in the *Iliad* 5, 9. To him was attributed an account of the destruction of Troy, extant only in a Latin version, but it is very doubtful whether the Latin work ever had a Greek original; if so, it cannot have been older than the Hellenistic period. The Latin version pretends to be the work of Cornelius Nepos, but in reality belongs to the fifth century A.D.; it is quoted by Isidorus. In the Middle Ages the work was much read in its present form, and together with the work of Dictys (q.v.) of Crete was the basis of a famous romance written by Guido delle Colonne (q.v.) in the thirteenth century. The best edition is by Meister (Leipzig, 1873). On the various late versions, consult: Dunger, *Die Sage vom trojanischen Kriege in den Bearbeitungen des Mittelalters* (Dresden, 1869); Körting, *Dictys und Dares* (Halle, 1874).

DAR-ES-SALAAM, dār'ēs-sā-lām'. The capital of German East Africa (q.v.), situated on the coast a few miles south of Zanzibar (Map: Congo Free State, G 4). It is a progressive town, with a good harbor, a number of churches and schools and public buildings. It is the seat of the central government of the colony and of the principal commercial houses. There is telegraph connection with Zanzibar, Tanga, Kilwa, and other important centres in the colony. Its population is about 21,000, including about 360 Europeans and 480 Arabs.

DARESTE DE LA CHAVANNE, dā'rēst' de lā shā'vān', ANTOINE ELISABETH CLÉOPHAS (1820-82). A French historian, born in Paris. He occupied the chair of history successively at the Collège de Rennes, the Collège Stanislas in Paris, the University of Grenoble, and that of Lyons, with which he remained associated in that capacity for more than twenty years. His partiality to the Catholic interests, however, eventually compelled his resignation, in 1878. His principal publication is the *Histoire de France* (2d ed., 7 vols. and suppl., 1879), a work distinguished by remarkable accuracy and profound scholarship.

DAR FERTIT, dār fēr-tēt'. A region in the Egyptian Sudan (q.v.), situated south of Darfur, in the upper part of the basin of the Bahr-el-Ghazal (Map: Congo, D 1). It is a country rich

in ivory and rubber, but very thinly inhabited. It was one of the largest slave-hunting centres in North Africa, and numerous depots or *dens* existed formerly for the collecting of slaves from the surrounding country. The population is extremely heterogeneous, consisting of a number of negro tribes.

DARFUR, dār'fūr (Ar., House of the Fur, a negro tribe of the province). A region with undefined boundaries in East Central Africa, under British control. It lies between Wadai, Kordofan, the Libyan Desert, and the Bahr-el-Ghazal region, covering an area of about 150,000 square miles (Map: Africa, G 3). It is traversed through the centre in a direction from northeast to southwest by the volcanic mountain range Marrab, whose extinguished craters rise above 5000 feet. On the east and west it is generally flat and sandy. Among the mountain chains there are numerous fertile valleys yielding wheat, cotton, sesame, tobacco, etc. During the rainy season, which lasts from June to September, the lower portions of the country are frequently covered with water, which produces a rich vegetation. Cattle-raising is carried on by the natives on a large scale. The manufacturing industries are insignificant and are chiefly confined to weaving and the manufacturing of small metal products. In some parts of the country copper and iron ores are found. The population of Darfur is estimated at 4,000,000, but some authorities put it at not more than 1,500,000. It consists of Arabs and Furs, all professing Islam. Capital, El Fasher. Prior to the revolt of the Mahdi, Darfur was a great centre of the caravan trade. Darfur was annexed to Egypt in 1874-75, but reasserted its independence after the Mahdi's revolt in 1883. In 1890-91 the greater part was acknowledged by Germany and Italy to be within the British sphere of influence. With the overthrow of the Dervishes in 1898 it became a part of the Egyptian Sudan.

D'ARGENS, dār'zhän'. See ARGENS.

DARGOMYZHSKY, dār'gō-mizh'skē. ALEXANDER SERGEYEVICH (1813-69). A famous Russian composer, founder, with Glinka, of the Russian National School of Music. He was the son of a wealthy nobleman in the Government of Tula. Speechless to his sixth year, he early exhibited fondness for music, and was taught the piano at six and violin at eight; his teachers, later, were Schöberlechner, a pupil of Hummel, in piano, and Zeibich in musical theory and singing. At Saint Petersburg in 1833 he met Glinka, who lent Dargomyzhsky his copy of Dehn's lectures on musical theory, which "he studied through in five months." Orchestration and composition he learned practically by assisting Glinka in the production of his *Life of the Czar* and by organizing various aquatic serenades on the Neva River, with private orchestras. He had by this time acquired a reputation as a song-writer, pianist, and quartet-violinist, and he decided to embrace music as a career. Later, in 1843, he gave up his governmental clerkship. He selected Hugo's *Lucrezia Borgia* for an opera, but, on the advice of Zhukovsky (q.v.), abandoned it in favor of *Esmeralda*, based on the *Hunchback of Notre Dame*. In 1839 the finished opera was translated into Russian, and was produced only in 1847, at Moscow, with a poor cast. In 1840 he began a cantata, *The Triumph of Bac-*

chus, but owing to the delays of *Esmeralda* he stopped work on it, and only finished it in 1848, as an opera-ballet, first produced in 1868. In 1844-45 he traveled, meeting Halévy and also Fétis, who made him known to western Europe. The delays of his opera 'deadened his inspiration,' but his personal success in 1853, at a charitable concert, encouraged him, and in 1855 the opera *Rusalka* (The Mermaid) was ready. Its production at Saint Petersburg (1856) left much to be desired, and the public received it coldly; the Halévy-Meyerbeer style of *Esmeralda* gave way to powerful dramatic recitatives, pronounced characterization, especially in comic scenes, and a strong national element. Only ten years later, the opera, when revived, achieved an unheard-of success. During this decade Dargomyzhsky became more and more retired. He spent his time giving vocal instruction to gifted amateurs, and, in a measure, trained a new generation of singers. He wrote three orchestral works: *Kazachok* (Cossack dance); *Finnish Fantaisie*, and *Baba-Yaga*, and while in Brussels (1864-65) won high praise with the *Kazachok* and the overture to *Rusalka*. His songs (he wrote about 100 in all) of this period are among the greatest of the world's *Lieder*. Among all composers he was perhaps the greatest master of recitative, and now he "wanted the sound to exactly express the word." Among the members of the Young Russian School he found the moral support he so sadly needed, and in 1868 he undertook to embody his new theories by setting to music Pushkin's dramatic sketch *The Stone Guest*, a variant of the Don Juan story. Even during his final illness he worked unceasingly and so successfully that after his death only ten and one-half lines had to be completed by Cui. The orchestration was finished by Rimsky-Korsakov. The work was produced in 1872, but had little success. It contains no ballet, choruses, set numbers, or ensembles. The text, without a change in one syllable, was set to 'melodic recitative,' ever-varying, fluent, expressive, like that of the fourth act of the *Huguenots*, or of *Otello*. The opera is unique in the history of dramatic music. Both his special vocal training and his theoretical views militated against Wagner's theories; his personages are always the protagonists musically, while the orchestra furnished the background, atmosphere, or dynamic part. Consult: Cui, *La musique en Russie* (Paris, 1880); Pougin, *Essai historique sur la musique en Russie* (Turin, 1897); Fétis, *Biographie universelle des musiciens* (Paris, 1862).

DAR'IC (Gk. δαρεικός, *dareikos*; supposed by the Greeks to be derived from Δαρειός, *Dareios*, OPers. *Dāraya-ra*[h]uš, Darius, but probably really from Babylonian *dariku*, weight, measure). A gold coin of ancient Persia, used in Greece as well as Asia. It was about the same weight as the Attic silver didrachma, and passed current as worth 20 drachmas. On the obverse is the figure of the Persian King kneeling, holding in one hand a spear, and in the other a bow, and on the reverse an irregular oblong stamp. It contained about 130 grains of gold, or as much as \$5.60, but its value in Attic silver was about \$7.20.

DARIEL. A transverse pass in the main chain of the Caucasus Mountains, at an altitude of 4122 feet. It is traversed by the main road

from Vladikavkaz to Tiflis, and is the *Porto Caucasica* of Strabo and the *Dariallan* of Oriental authors.

DA'RIEN. A city and port of entry, and the county-seat of McIntosh County, Ga., 60 miles south by west of Savannah, on the Altamaha River 12 miles from the ocean, and on the Darien and Western Railroad (Map: Georgia, E 4). It exports large quantities of pine lumber, cross-ties, rice, fish, and garden produce. Settled in 1736. Darien was incorporated as a town in 1816, and was chartered as a city in 1818. The government is administered by a board of five persons selected by the grand jury and confirmed by the Governor of the State, one of these five being chosen as chairman of the council and ex-officio mayor. Population, in 1890, 1491; in 1900, 1739.

DARIEN'. An open-mouthed gulf of the Caribbean Sea on the western part of the north coast of South America, separating the two Colombian departments of Panama and Bolívar (Map: Colombia, B 2). Its southern extension, called Gulf of Urabá, affords good anchorage. The rainy coastland is hilly and thickly overgrown. The chief affluent is the Atrato (q.v.). The name Darien was also applied to the Isthmus of Panama (q.v.) and to a province in the Republic of New Granada, corresponding to the present State of Panama in Colombia. One of the earliest Spanish settlements on the mainland was in Darien, the region being then also called by the Spaniards *Castilla de Oro* ('the Golden Castile') and forming the best-known part of their *Tierra Firme*. In 1513 Balboa, Governor of the Darien settlement, crossed the Isthmus with 290 men, and on September 25 first caught sight of the Pacific.

DARIEN SCHEME. A scheme projected by William Paterson (q.v.) in 1695, for the purpose of forming a settlement on the Isthmus of Darien for controlling the trade between the Eastern and Western Hemispheres. It was one of the most disastrous commercial speculations in history. Nine hundred thousand pounds were quickly subscribed, a large part of it by Scottish merchants, and in 1698 1200 colonists, recruited in Scotland, proceeded to the Isthmus to lay the foundations for their prospective commercial centre 'New Caledonia.' Their number was rapidly reduced, however, by starvation and disease, and in June, 1699, the survivors returned. Soon afterwards the Scotch sent out another company, of 1300, but this likewise was soon forced to return, and a third company, which arrived in February, 1700, was almost immediately driven away by the Spaniards. For a brief account of the enterprise, consult H. H. Bancroft, *History of Central America*, vol. ii. (San Francisco, 1883).

DA RIMINI, dà rē'mē-nē, FRANCESCA (?-1389). A woman of extraordinary beauty, daughter of Guido Minora, a nobleman of Ravenna. She was married to Gianciotto Malatesta of Rimini, a dwarf, who, detecting her in criminal relations with his brother, Paolo, killed them both. The story has formed a favorite theme for poets. It forms the basis of one of the most famous episodes of Dante's *Divina Commedia* (*Inf.*, v., 73-142); Leigh Hunt wrote a poem, the *Story of Rimini* (1819); Silvio Pellico and D'Annunzio have each found in the tale the subject of a

tragedy, and so also has the English poet Stephen Phillips (q.v.) in his *Paolo and Francesca*.

DARI'US. The name of several Persian kings, and, like the Egyptian Pharaoh, *titular* and not *personal*. According to Herodotus (6. 98). *Δαρείος* signifies one who restrains; but the old Persian form, *Dāraya-va(h)uš* shows that it signifies upholding what is good. The most famous of the name is called DARIUS I., or DARIUS HYSTASPIS, from his father's name. (See HYSTASPES.) He was born B.C. 558, and was a Persian and of the Achæmenian line. On the death of Cambyses (B.C. 522), he leagued himself with six other nobles to murder Smerdis the Magian, who had usurped the throne. The conspirators were successful in their plot, and Darius was chosen King. An account of these occurrences is given in the great Behistun inscription, which serves to supplement or correct the narrative of Herodotus. His position at first was very insecure, but his caution, skill, and energy enabled him to govern his vast dominions for thirty-six years. To strengthen himself, he married the daughter of Otanes, who had been the head of the conspiracy, and likewise took three wives from the royal household—viz. two daughters of Cyrus's son, Smerdis. He then divided his empire into twenty satrapies, and determined the exact amount of the taxation to be borne by each. In some of the remoter provinces great confusion seems to have prevailed after the death of Smerdis the Magian; and a proof of how little Darius could effect at first is afforded by the conduct of Orætes, the Governor of Sardis, who for some time was quite defiant of his authority. The inscriptions of Darius contain the account of no fewer than nine or ten rebellions against his sway. Babylon also revolted, and Darius besieged the city unsuccessfully for two years. At last, however, it was taken by an extraordinary stratagem of his general, Zopyrus (516). It is more likely, however, that the account of the conquest of Babylon, as given by Herodotus (3. 150), belongs to the first siege of the city. In the year B.C. 514 Darius is thought to have begun the great rock inscription of Behistun, which records the events of his reign. In 513 B.C. with an army of 700,000, crossed the Bosphorus by a bridge of boats, marched to the mouth of the Danube, crossed the river, and advanced against the Scythians. The expedition proved a failure. Darius retreated, but detached from his main force an army of 80,000 men, under Megabyzus, to conquer Thrace, while he himself returned to Asia, whence he extended his authority in the east as far as the Indus. About 501 B.C. the Ionian cities rose in revolt against Persian dominion. They were unsuccessful, the final victory of the Persians being achieved in the naval battle at Lade and the taking of Miletus (494). The assistance given by the Athenians and Eretrians to the Ionians, and the part which they had taken in the burning of Sardis, determined Darius, who was also influenced thereto by the banished Hippias, to attempt the subjugation of the whole of Greece. In 492 he sent Mardonius with an army into Thrace and Macedonia, and at the same time dispatched a fleet against the islands. The former was routed by the Brygi in Thrace, the latter was shattered and dispersed by a storm when rounding the promontory of Mount

Athos. In 490 he renewed his attempt. His fleet committed great ravages in the Cyclades, but his army was entirely defeated at Marathon by the Athenians, under Miltiades, the tyrant of the Chersonese. In the midst of his preparations for a third expedition, Darius died B.C. 486, and was succeeded by his son Xerxes. His tomb is still to be seen at Nakshi-Rustam. Darius was an able ruler, and he organized and wisely administered the kingdom which Cyrus had founded. His liberality to the Jews in connection with the rebuilding of the Temple at Jerusalem is referred to in the Bible. For the inscriptions of Darius, consult: Rawlinson, *Journal of the Royal Asiatic Society of Great Britain*, vol. x. (London, 1847); Spiegel, *Altpersische Keilinschriften* (Leipzig, 1882); Weissbach and Bang, *Altpers. Keil.* (Leipzig, 1893); Tolman, *Old Persian Inscriptions* (New York, 1893); Justi, in *Grundriss der iranischen Philologie* (Strassburg, 1897). See ACHÆMENES; CAMBYSES; CYRUS; PERSIA.

DARIUS II., called, before his accession to the throne, *Ochus*, and after his succession *Nothus*, the Bastard. He was one of the seventeen bastard sons of Artaxerxes I., Longimanus. When Sogdianus, another of the bastards, had murdered the rightful King, Xerxes II., and assumed for himself the regal power, Ochus declared war against him, slew him, and secured the diadem for himself (B.C. 424-23). He now called himself Darius. His reign was ignoble. He showed himself to be completely under the control of his eunuchs and his cruel step-sister and spouse, Parysatis. Rebellions were constantly breaking out among his satraps, all of which, however, were crushed except that of Amyrtæus, Satrap of Egypt, who made himself independent in 414. It was during the life of Darius, and chiefly through the craft of Tissaphernes, Satrap of Asia Minor, and of his successor, Cyrus the Younger, son of the King, that the Persians exercised so great an influence over the affairs of Greece in the last years of the Peloponnesian War. Darius died B.C. 405-04.

DARIUS III., called before his accession *Codomanus*; a monarch noted for his mild disposition, handsome person, and courageous spirit. He was great-grandson of Darius II., and was raised to the throne through the help of Bagoas, after the murder of Arsēs (B.C. 336). But in spite of his superior qualities he could offer no solid opposition to the advance of the Macedonians. At the battle of Issus, in 333, his mother, wife, and three children fell into the hands of Alexander; the victory of Gaugamela, near Arbela (q.v.), in 331, opened to the latter the way to Susa and Persia proper. Darius now fled to Ecbatana, in Media; and, on the approach of his opponent, fled from there to the northern provinces, where he was seized by Bessus, Satrap of Bactria. Alexander, in a fit of generosity, hurried to deliver Darius. Bessus then prepared for flight; but Darius, refusing to follow, was stabbed by the barbarian and left. The scouts of Alexander's cavalry found Darius dying, and administered to his last necessities. Thanking the Grecian King for his magnanimity, and commending his family to his care, he expired (330). Alexander sent the dead body to Sisymbria, mother of Darius, to be interred in the tomb of the Persian kings. With him the Achæmenian line and the Persian

Empire, that had so long dominated Asia, came to a close. Consult Justi, *Grundriss der iranischen Philologie* (Strassburg, 1897).

DARIUS THE MEDE. The son of Ahasuerus, and conqueror of Babylon, according to the biblical narrative of the Prophet Daniel (Dan. v. 31; vi. 28; ix. 1; xi. 1). His age is given as sixty-two years at the time of the taking of the city. There is great difficulty in identifying this ruler, whom Daniel speaks of as "Darius the son of Ahasuerus, of the seed of the Medes, which was made King over the realm of the Chaldeans" (Dan. ix. 1). Some scholars have suggested an identity with Cyaxares II. (q.v.), or more likely with Gobryas, Governor of Gutium, who actually took the city of Babylon as chief in command for Cyrus. (See CYRUS THE GREAT.) But much uncertainty on the whole subject prevails. Some suggestions may be gained from Horner, *Daniel, Darius the Median, Cyrus the Great* (Pittsburg, 1901).

DARJILING. *där-jël'ing*, or **DÖR-JILING** (Tib. *Dar-ryas-glin*, land of the diamond thunderbolt—i.e. of the Lama's sceptre). A popular sanitary station of Bengal, British India, capital of a district of the same name, in the Sikkim Himalayas (Map: India, E 3). It is situated 7200 feet above the sea, on the side of a great hollow or basin, in which flows the Runjit, a branch of the Tista. It commands a magnificent view of the Himalayas to the north and west, and is on the Darjiling and Himalayan Railway, a road remarkable for its elevation. Notwithstanding frequent heavy rains and a great annual rainfall, the climate is very salubrious. Mean annual temperature, 54° F. Darjiling has good bazaars, a fine sanitarium, beautiful botanical gardens, two Anglican churches, an excellent water-supply, and is, especially during October, the fashionable Indian health resort. Tea-growing is the principal industry of the district. Fifty thousand acres are devoted to its cultivation, and as much as 8,000,000 pounds has been produced annually. Darjiling is about 36 miles from the Plain of Bengal and 308 miles north of Calcutta. It was obtained by the British Government from the Rajah of Sikkim in 1835, in order to be made a sanitary station. Population, including the adjacent cantonment, 14,100.

DARK AGES. A name formerly applied either to the whole or the earlier part of the Middle Ages (q.v.).

DARK AND BLOODY GROUND, THE. A name given to the State of Kentucky as the scene of frequent Indian warfare in the days of the early settlers. The phrase has also been said to be a translation of the Indian word Kentucky.

DARK CONTINENT, THE. Africa, the least known of the earth's great divisions. The term is also explained as referring to the color of the inhabitants.

DARK DAY. Any day in which the sunlight appears to be remarkably dim or altogether absent. In New England the term is specifically applied to May 19, 1780, also known as Black Friday; but many similar dark days are also on record in other parts of the world. Other notable dark days in the United States were those of October 21, 1716, and October 19, 1762. Stygian darkness often prevails during erup-

tions of ashes from volcanoes. In recent years the months of August and September, 1881, were remarkable in the eastern part of the United States for a long series of days in which artificial light was oftentimes necessary at mid-day and business was generally very much interrupted. In this case the darkness is known to have been the result of a combination of ordinary cloudiness with the smoke from forest and prairie fire, and it is presumable that the same conditions must have obtained during the historical dark days of the previous century. The *United States Monthly Weather Review*, for September, 1881, page 27, says: "The foggy or smoky condition of the atmosphere became quite general from the first to the tenth of this month over that portion of the United States between the meridians of 67° and 87° W. and the parallels of 40° and 45° N. It reached an unusual culmination in density in the eastern portion of the Middle Atlantic States and throughout New England, where it interrupted the prosecution of business and compelled the use of artificial light. The destructive violence of prairie and forest fires throughout northern Michigan and portions of Canada has perhaps never been exceeded, and the intensity of the accompanying smoke was simply dreadful. On September 6 southwesterly winds prevailed from Tennessee northward to Lake Superior, and thence eastward to the Canadian maritime provinces, and smoke was reported as far south as Knoxville, westward to Milwaukee, northward to Rockliffe, Canada, and eastward to New Brunswick. To show the progress eastward of this condition in the atmosphere it is necessary to trace the movement of low-pressure areas over Canada and northern New England, and watch the accompanying change in wind directions." The darkness of the dark day of May, 1780, covered very much the same area, with southwest winds and occasional light rains, and was undoubtedly of the same nature, although in both cases it was attributed by the superstitious to supernatural causes. On the plains of Tibet, according to Marco Polo and other travelers, dark days are sometimes caused by clouds of dust so fine and light that it is carried to a great distance by the wind. Similar days of darkness have been caused by clouds of mingled vapor, smoke, and dust emanating from volcanic eruptions, although such clouds do not usually extend to the great distances reached by clouds of smoke from forest fires. Cases of such volcanic clouds occurred in connection with the eruption of Mont Pelée and La Soufrière in the West Indies in May, 1902.

DARKE, WILLIAM (1736-1801). An American soldier, born in Philadelphia. He served under Braddock; rose to the rank of colonel in the American Army during the Revolutionary War; and in 1791 commanded the left wing of Saint Clair's army, which, on November 4, was defeated by the Miami Indians.

DARK HORSE. A term familiarly used in the vocabulary of American politics, and applied to a comparatively unknown man brought forth in a nominating convention at the supreme moment as a candidate for office in the place of a prominent rival candidate of his own party whose nomination would incur the risk of a divided vote. James K. Polk and Franklin Pierce

were typical 'dark horses' of the Democratic Party; Rutherford B. Hayes and James A. Garfield of the Republican.

DARK LADY, THE. In Shakespeare's *Sonnets*, the woman thought, by those who maintain that William Herbert is the dedicatee, to be Mary Fitton, one of Elizabeth's maids of honor. It is certain that Herbert and she created a scandal. Another suggestion, with fewer supporters, is Penelope Devereux, Lady Rich, the "Stella" of Sidney's sonnets.

DARLASTON. A town in Staffordshire, England, four miles southeast of Wolverhampton (Map: England, D 4). It has extensive mines of iron and coal, and manufactures of hardware. Population, in 1901, 15,400.

DARLEY, FELIX OCTAVIUS CARR (1822-88). An American painter and engraver, born in Philadelphia. He illustrated the works of Irving, Cooper, Longfellow, Hawthorne, and Shakespeare, and made 500 drawings for Lossing's *History of the United States*. Among his best-known illustrations are those for the *Legend of Sleepy Hollow*, *Rip Van Winkle*, and Dickens's *Great Expectations*. In 1868 he published, after a visit to Europe, *Sketches Abroad with Pen and Pencil*. His water-color paintings of incidents in American history are full of spirit.

DARLEY, GEORGE (1795-1846). An English poet. He was born in Dublin in 1795; was graduated from Trinity College, Dublin, in 1820, and went to London, where he wrote critical papers for the magazines, and eventually joined the staff of the *Athenæum*, becoming famous for his caustic reviews. He died November 23, 1846. Under the inspiration of the Elizabethans, Darley produced several lyrical dramas containing passages of great beauty—*Sylvia, or the May Queen* (1827), and the inferior *Thomas à Becket* (1840) and *Ethelstan* (1841). As early as 1822 he had published *The Errors of Ecstasie*, a melodious poem in blank verse, followed by *Lilian of the Vale* (1826), a thrilling tale. He also wrote several treatises on mathematics, which were praised by Carlyle. For specimens of his verse consult Stedman, *Victorian Anthology* (New York, 1895).

DARLING. A mountain range of western Australia, extending north and south for about 250 miles, parallel with the coast and from 20 to 70 miles distant (Map: Australia, B 5). It ends near Point D'Entrecasteaux. Its highest summit reaches 3700 feet.

DARLING RIVER (named in honor of Sir Ralph Darling, Governor of New South Wales, 1825-31), or **BARCOON RIVER.** An Australian stream, the most important tributary of the Murray (Map: New South Wales, C 2). It rises in southeastern Queensland, flows through New South Wales, and joins the Murray on the Victoria border. The area of its basin is about 200,000 square miles. During the dry season its course is marked by a succession of pools or small lakes; but during the winter, when it is subject to sudden floods, it is navigable by light-draught steamers for over 600 miles to Bourke, the terminus of the Great Western Railway, from Sydney. Most of the region of the Darling is but a desert in the dry season.

DARLING, GRACE HORSLEY (1815-42). An English heroine. She was born in Bamborough,

Northumberland, the daughter of William Darling, lighthouse-keeper on Longstone, one of the Farne Islands. On the morning of September 7, 1838, the steamer *Porfarskire* was wrecked near the lighthouse, and all but nine of the sixty-three passengers perished. In spite of the danger of such an undertaking, the father and daughter made two trips to where the survivors lay, and rescued all of them. News of the exploit was received with great enthusiasm by the English people, and by popular subscription the sum of £750 was raised for the heroine. Consult *Grace Darling: Her True Story, from Unpublished Papers in the Possession of the Family* (1880).

DARLINGTON. A Parliamentary and municipal borough and market town in Durham County, England, on the Skerne, near its junction with the Tees, 18 miles south of Durham City (Map: England, E 2). The town is laid out in wide and regular streets, and has a spacious market-place. The parish church of Saint Cuthbert, a handsome Early English edifice, was founded about 1160 by Bishop Pudsey. Darlington sends one member to Parliament. It received its charter of incorporation in 1867. It has owned its gas and water supply since 1854, and it maintains public baths and markets. Its principal manufactures are iron and worsteds, and there are extensive locomotive works belonging to the Northeastern Railway. The first passenger railway operated by steam was opened in 1825 between Darlington and Stockton. Population, in 1891, 38,000; in 1901, 44,500. At Oxen-le-field, three miles from Darlington, are curious cavities of unknown origin, called Hell Kettles. From Anglo-Saxon times till 1867 Darlington was under the authority of the Bishop of Durham. Consult Longstaffe, *History and Antiquities of Darlington* (London, 1854).

DARLINGTON. A town and the county-seat of Darlington County, S. C., 82 miles east by north of Columbia, at the junction of two divisions of the Atlantic Coast Line Railroad (Map: South Carolina, E 2). It carries on a considerable trade in cotton, tobacco, and grain, the principal products of the surrounding agricultural region. There are cotton-mills, tobacco-factories, fertilizer-works, etc. Population, in 1890, 2389; in 1900, 3028.

DARLINGTON, WILLIAM (1782-1863). An American botanist, born at Birmingham, Pa. In 1806 he went to India, and on returning published an account of his voyage. In 1814 he was chosen to Congress, and in 1819 was reelected. At Westchester, Pa., he founded an atheneum, an academy, and a society of natural history. Among his publications are: *Mutual Influence of Habits and Disease; Agricultural Chemistry; Agricultural Botany* (1847); and *Memorial of John Bartram* (1849).

DAR'MESTETER, AGNES MARY FRANCES. See ROBINSON, AGNES MARY FRANCES.

DARMESTETER, därm'ste-târ'. JAMES (1849-94). A French Orientalist, whose eminence was achieved especially in the field of Iranian scholarship. He was born, of Jewish parentage, at Château-Salins, in Lorraine. He was educated at the Lycée Bonaparte, Paris, from which he graduated with the highest honors in 1867, when he began to devote himself to Oriental philology, chiefly under the guidance of the gift-

ed Michel Bréal. In 1877 he was appointed assistant professor of Zend at the Ecole des Hautes Etudes, and in 1885 was advanced to the professorship of Iranian languages and literature at the Collège de France. In 1886 he visited India, to make special philological researches in connection with the sacred books of the Parsis, and was afterwards honored by an appointment as fellow of Bombay University. For years he had acted as secretary of the Société Asiatique de Paris, and he was likewise busily engaged as an editor of a leading political and literary periodical, *La Revue de Paris*, at the time of his death. His writings in the field of Avestan philology and Zoroastrianism are of prime importance, even if his theories, which are often very radical, cannot always be accepted. Among his works may be mentioned: *Haurvatât et Ameretat, Essai sur la mythologie de l'Avesta* (1875); *Ormuzd et Ahriman, leurs origines et leur histoire* (1877); *Etudes iraniennes* (1883); *The Zend-Avesta* (translated 1880, 1883); *Essais orientaux* (1883); *Chants populaires des Afghans* (1888-90); *Les prophètes d'Israël* (1892); and his most important work, *Le Zend-Avesta; Traduction nouvelle* (3 vols., 1892-93). A number of his literary essays have been translated into English by Helen Jastrow (Boston, 1895), and by his wife (New York, 1897).

DARMSTADT, därm'stât (Ger., city of the Darm, the river near which the city lies). The capital of the Grand Duchy of Hesse, Germany, and residence of the Grand Duke, about midway between the Rhine and the Main, at the north-western extremity of the Odenwald, and 17 miles south of Frankfort-am-Main (Map: Germany, C 4). It consists of an old and new town, the streets of the former being narrow and crooked, but those of the latter broad and handsome, exhibiting many imposing specimens of architecture. Its principal square, the Luiseplatz, adorned with a lofty column, surmounted by a bronze statue of Grand Duke Louis I., who founded the new town, contains the post-office, the Government building, and the old palace. The Grand Ducal Palace, surrounded by pleasant gardens, was begun in the fifteenth century, but practically rebuilt in the early part of the eighteenth. It contains a valuable library of some 500,000 volumes, an archaeological collection, and a picture gallery with some good examples of the early German and the Netherlandish masters. The chef-d'œuvre is the so-called Meyer Madonna, by Holbein the Younger. Prominent among numerous churches are the Stadtkirche, with the handsome monument of Landgrave George I., and the Roman Catholic church built after the Pantheon at Rome, with a lofty dome supported by twenty-eight columns. Other notable features include the new palace, the palace of Prince Henry, the old and new town halls, theatre, and the Herrgarten, a fine public garden and park. Darmstadt is the seat of government for the grand duchy and for the province, and of the provincial court of appeal. The town's affairs are administered by a municipal council of 42, and an executive board of 3 members. It owns its water-supply, and operates gas-works and an electric-light plant. Its educational institutions include two gymnasia, a high school, technical school, the Municipal Victoria School, and several elementary schools. Among its charitable institutions are

a municipal hospital and the Alice and provincial hospitals.

Darmstadt is a manufacturing town of growing importance. The chief articles of industry are machinery, carpets, hats, tobacco, chemicals, scientific instruments, playing-cards, and beer. Darmstadt is an important railway centre. An electric street railway accommodates internal traffic. The famous chemist Justus von Liebig was a native of the town, and the composer Flotow died here. To the east of the town is the Palace of Rosenhöhe, with the grand-ducal mausoleum, containing the tombs of the Grand Duke Louis IV. and his wife, Princess Alice of England. Population, in 1890, 56,000; in 1900, 64,000.

Darmstadt appears as Darmundstadt in the eleventh century. It acquired municipal rights in 1330, and became in 1567 the capital of Hesse-Darmstadt. It was burned by the French in 1688 and 1693, but attained great prosperity toward the end of the eighteenth century.

DAR'NEL (Fr. dial. *darnelle*; probably from OF. *darne*, stupid, Dan. *daare*, fool; so called from its supposed stupefying power), *Lolium temulentum*. A grass of the same genus with the valuable rye-grass (q.v.), an annual, common in grain-fields in England and in many parts of Continental Europe, and introduced in some parts of the United States. This grass has from ancient times been reputed to have a narcotic, poisonous seed, to which many bad effects were ascribed. Lindley, in his *Medical and Economical Botany*, published in 1849, ascribes narcotic and acrid qualities to darnel-seed, and speaks of fatal consequences as produced by it when mixed with flour, saying that it "is the only authentic instance of unwholesome qualities in the order of the grasses." Recent investigations have shown the presence of a fungus in the grain of this grass and to it the poisonous qualities are attributed. The fungus seems to be almost always present in the seed of this species and rare in the other species of the genus.

DAR'NELL, HENRY FAULKNER (1831—). An English Protestant Episcopal clergyman, born in London. For some time he was principal of Hellmuth Ladies' College at London, Ontario, and of Dufferin College in the same city. Afterwards he became rector of the Episcopal church at Avon, N. Y. His publications include: *Philip Hazlebrook* (1887); *The Craze of Christian Englehart* (1890); and *Songs of the Season* (1895).

DARNÉTAL, dār'nā'tāl'. The capital of a canton in the Department of Seine-Inférieure, France, at the confluence of the Aubette and Rohee, 2½ miles east of Rouen. Its noteworthy buildings are a Gothic church, a fine early sixteenth-century belfry, and the town hall. The town commands a good view of Rouen. It has important manufactures of woollens. Population, in 1901, 6826.

DARNING-NEEDLE. A dragon-fly or damselfly: supposed by ignorant folk to be attempting to pierce and 'sew up' one's ears or do other mischief as it darts about one's head; hence the term is frequently extended to 'devil's darning-needle.' See DRAGON-FLY.

DARN'LEY, HENRY STEWART, OF STUART, Lord (1545-67). The second husband of Mary.

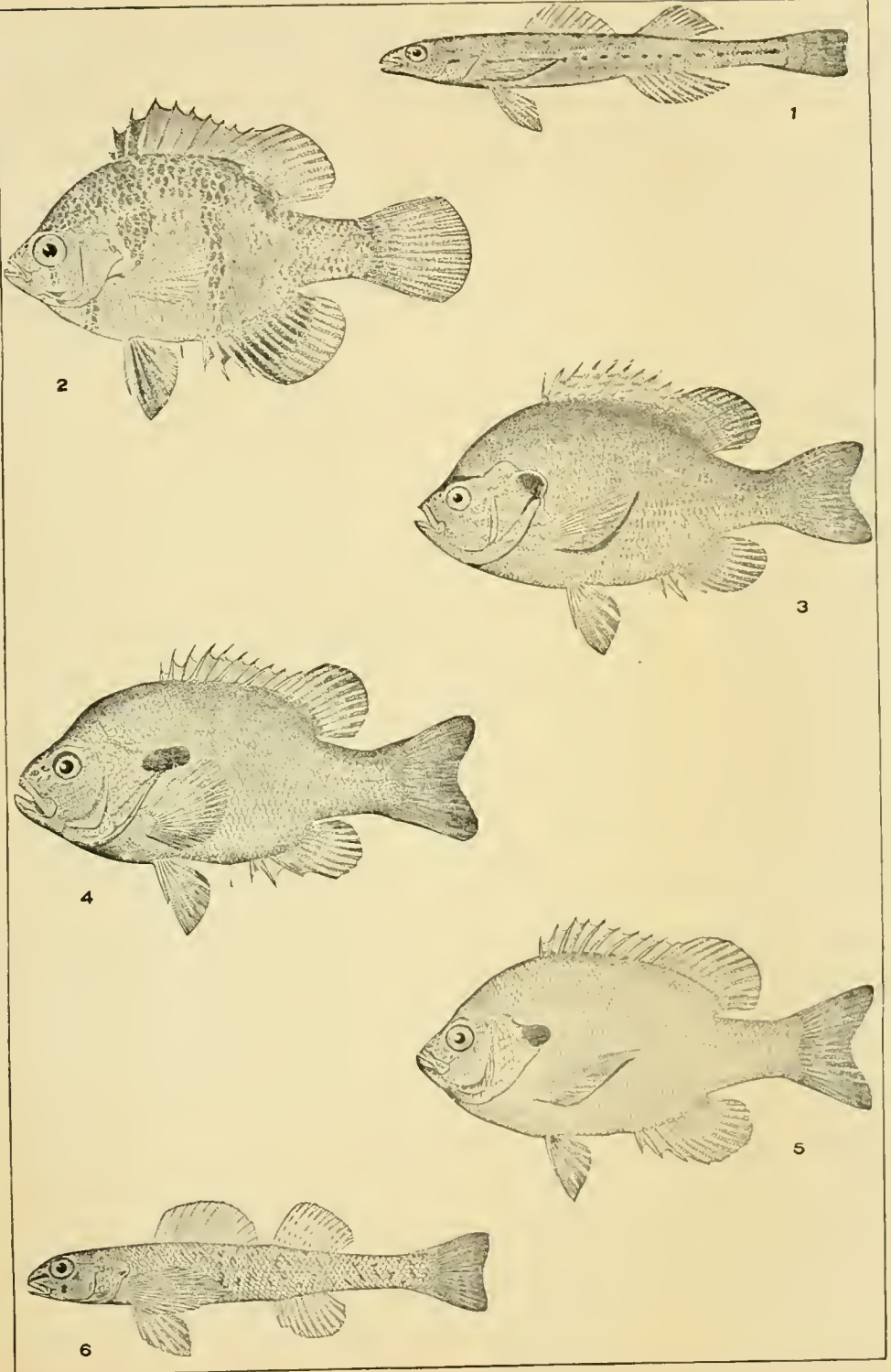
Queen of Scots. The second but eldest surviving son of the Earl of Lennox by Lady Margaret Douglas, niece of Henry VIII., he was born December 7, 1545, at Temple Newsam, Yorkshire, where he received a private education. He was handsome, and of accomplished manners, but destitute of moral and intellectual power. He married Mary on July 29, 1565, but soon disgusted her by intemperance, profligacy, and insolence. As an accessory to the assassination of Rizzio, he intensified Mary's hatred by holding her while the deed was committed in her presence. While recovering from an illness, he met his death in an isolated house which was blown up by the Earl of Bothwell, February 9, 1567. See MARY STUART.

D'ARREST, dār-rĕst', HEINRICH LUDWIG (1822-75). A German astronomer. He was born in Berlin, and studied astronomy there under Encke. He was subsequently connected with the observatories of Berlin and Leipzig, and became in 1852 professor in the Leipzig University. In 1857 he became professor of astronomy in Copenhagen, where he died. His important publications include: *Siderum Nebulosorum Observationes Havnienses* (1867), and numerous astronomical papers in scientific journals. His original observations include discoveries of several comets, and of the planet Freia (1862).

DARTER (so called from the quick motion). One of a group of small fresh-water fishes of the perch family, peculiar to the United States. None is more than 10 inches in length, and the least is only 1½ inches long—the smallest spiny rayed fish known. All are powerful swimmers, and have been spoken of by Forbes as concentrated rather than dwarfed fishes. "They have developed," he says, "an activity and hardihood, a vigor of life, and a glow of high color almost unknown among brook-fishes elsewhere." They have been the subject of special study by Dr. D. S. Jordan, who tells us that most of them prefer clear running water, where they lie on the bottom concealed under stones, darting, when frightened or hungry, with great velocity for a short distance, then stopping as suddenly. All are carnivorous, and feed chiefly on the larvae of flies. These beautiful and very interesting little fishes exist in great variety throughout the central and southern United States, and are universally known to country boys as 'Johnny darters,' a name particularly given to a typical species (*Boleosoma nigrum*). A few others of the larger ones have received other names locally, as the sand-darter (*Ammocrypta pellucida*), indicating the preference of its genus for sandy bottoms. (See Plate of DARTERS AND SUNFISH.) Excellent popular accounts will be found in *The American Naturalist* for 1876 and 1880; and a full history of the group in Jordan and Evermann's *Fishes of North America*, pages 1016 to 1105 (Washington, 1896).

DARTER, OR SNAKE-BIRD. A name given to certain steganopod birds, nearly allied to cormorants, but having a bill longer than the head, perfectly straight, slender, and sharp-pointed; and also remarkable for the great length of the neck, which has obtained for them the name 'snake-birds.' They generally live in pairs near bodies of fresh water. If alarmed while sitting on a branch over a stream or by the edge of a lake, they drop off quietly into the water, sink

DARTERS AND SUNFISH



1. SAND DARTER (*Ammocrypta pellucida*).
2. BLACK-BANDED SUNFISH (*Mesogonistus chætodon*).
3. COMMON SUNFISH OR PUMPKIN-SEED (*Eupomotis gibbosus*).

4. YELLOW-BELLIED SUNFISH (*Lepomis aurtus*).
5. BLUE OR COPPER-NOSED SUNFISH (*Lepomis patildus*).
6. JOHNNY DARTER (*Boleosoma nigrum*).

gently beneath the surface and disappear; or they may fly upward and circle about like a hawk. They make rude nests upon trees and lay chalky blue eggs. They eat great quantities of fish, which they kill by a quick, snake-like darting forward of the closed beak, impaling the prey, which is then flung into the air, caught in the



BEAK OF THE DARTER.

mouth and swallowed entire. Four species are known, constituting the family Anhingide. One species occurs in Africa, one in southern Asia, one in Australia, and one in tropical and subtropical America. The last (*Anhinga anhinga*) is sometimes called the water-turkey, and wanders in summer as far north as southern Illinois. It is a handsome bird, about three feet long, glossy black, the back marked with numerous silvery white spots or streaks. See Plate of FISHING BIRDS; and Colored Plate of EGGS OF WATER AND GAME BIRDS.

DARTFORD (AS. *Darentford*). A town in Kent, England, 14 miles east-southeast of London Bridge, on the Darent, about three miles from its junction with the Thames (Map: England, G 5). It lies in a narrow valley between two steep hills. It has large corn-mills, cotton and silk printing-works, large powder and paper mills; also manufactures of oil, iron, machinery, and chemicals. The first paper-mill in England was built here by Spielman, jeweler to Queen Elizabeth in 1590. The City of London Lunatic Asylum is situated here, and there are interesting ruins of a nunnery, founded 1355 by Edward III. Wat Tyler's insurrection, in the reign of Richard II, broke out at Dartford in 1381. Population, in 1891, 12,000; in 1901, 18,600.

DARTLE, ROSA. The companion of Mrs. Steerforth, in Dickens's *David Copperfield*. She is wildly jealous of Steerforth himself, although he was the cause of the disfiguring scar upon her face.

DARTMOOR (named from the river Dart, which rises in the region). A granitic tableland in the southwest of Devonshire, England, remarkable for its wild, rugged scenery and cyclopean relics of aboriginal inhabitants (Map: England, C 6). Dartmoor proper (or the ancient forest of that name) and the outlying common lands are about 20 miles square. This moorland region, encircled by a natural rampart, and moated by deep valleys, has a considerable elevation above the surrounding country, and culminates in Yes Tor, 2040 feet above the sea-level. Copper is found, and at Wheal, Duchy, and Birch Tor are productive tin-mines. The largest kaolin-works in England are at Lee Moor, which is also the seat of a meteorological observatory. The soil is composed chiefly of peat, which in the bottoms has accumulated in some places to the depth of 25 feet, and it rests on a subsoil of fine sand. Many of the well-watered dells and ravines are fertile, while the whole moor affords pasturage for cattle, sheep, and horses. The antiquities include the Gray Wethers, a fine specimen below

Sittaford Tor, of what is now styled a Druidical temple, the vestiges of a large aboriginal village at Grimspound, the cromlech at Drewsteignton, logans, stone avenues, dolmens, barrows, cairns, rock-pillars, and ancient trackways.

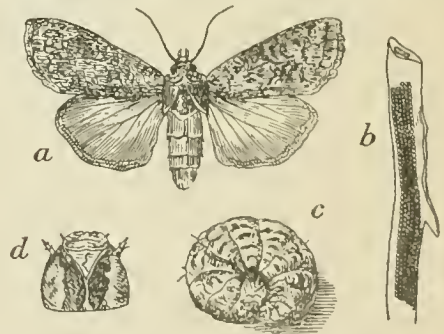
During the long war with Napoleon, a prison, now used for convicts, was erected in western Dartmoor for French captives. Prince Town sprang up close by, and soon became a thriving place. During the war with the United States (1812-15), many captured Americans were confined at Dartmoor. See DARTMOOR MASSACRE.

The castle, manor, and forest of Dartmoor were granted by Henry III. to his brother Richard, Earl of Cornwall, and since 1337 Dartmoor has been, in part, permanently annexed to the Duchy of Cornwall. Dartmoor figures conspicuously in poetry and romance. Consult Rowe, *A Perambulation of the Ancient and Royal Forest of Dartmoor*, etc. (Plymouth and London, 3d ed., 1896).

DARTMOOR MASSACRE, THE. The killing (April 6, 1815) by a company of English soldiers of some American prisoners, who, together with 6000 others, had been confined in the Dartmoor (England) prison for several months after the close of the War of 1812 between England and the United States. To quell what they regarded as a mutiny and to thwart an apparent effort at escape, the prison guard, probably under orders from Capt. T. G. Shortland, their commanding officer, fired upon the prisoners, killing seven and wounding about sixty—thirty of them dangerously. The Americans at the time regarded this as an act of wanton murder, but it was pronounced justifiable by a joint commission, which, however, acquitted the prisoners of the charge of organizing a mutiny or of planning an escape. The British Government soon afterwards promoted Shortland, but made liberal provision for the families of those who had been killed or permanently disabled. Consult: Andrews, *The Prisoners' Memoirs; or, Dartmoor Prison* (New York, 1852); and Cobb, *A Green Hand's First Cruise, Together with Five Months in Dartmoor* (Boston, 1841).

DARTMOOR PRISON. See DARTMOOR, and DARTMOOR MASSACRE.

DART-MOTH. A noctuid moth of the genus *Agrotis*, whose caterpillars are cutworms, some-

A DART-MOTH (*Agrotis saucia*).

a, Adult moth; b, deposit of eggs; c, caterpillar (a cutworm); d, head of caterpillar.

times called 'climbing cutworms.' A species very widespread in both Europe and America is *Agrotis saucia*, whose wings expand an inch and

a quarter. The fore wings are grayish brown variegated with black; the hind wings whitish, deepening into brownish toward the margin. The caterpillar is nearly 2 inches long when mature, and is of a dull flesh-color mottled with brown and black. When ready to pupate it descends and forms a smooth cavity in the ground for that purpose. These caterpillars feed on the leaves of fruit-bearing trees and shrubs.

DARTMOUTH, därt'müth. A town of Halifax County, Nova Scotia, Canada, situated on a small river emptying into Chebucto Bay, opposite the city of Halifax, of which it is practically a suburb connected by ferries (Map: Nova Scotia, F 5). It contains handsome residences, the provincial asylum for lunatics, several foundries, rope-walks, a sugar-refinery, and tanneries. Dartmouth, founded in 1749, was destroyed by Indians in 1751. Fort Clarence, below the town, commands the narrow and dangerous eastern passage, which was considered impassable for large vessels until 1862, when the Confederate steamer *Tallahassee* escaped through it. Population, in 1891, 6252; in 1901, 4806.

DARTMOUTH. A municipal borough and seaport of Devonshire, England, built in terraces on a steep slope 300 to 400 feet high on the River Dart, at a short distance from the sea (Map: England, C 6). The streets are narrow and many of the houses very old, with overhanging stories, projecting gables, and wood-carvings. Saint Saviour's Church, of the fourteenth century, has a richly sculptured stone pulpit, a highly ornamented, painted, and gilt interior, and a beautifully carved rood-loft. A battery and the remains of a castle built during the reign of Henry VII. stand at the entrance to the harbor, which affords secure anchorage for vessels. In the river above the town is anchored the cadet training-ship *Britannia*. The commerce and shipping trade of Dartmouth is of considerable importance. Its fisheries are quite extensive and the town is a coaling station for the south coast. It has a resident United States consular agent. Population, in 1891, 6000; in 1901, 6600. Sir Humphrey Gilbert, the Newfoundland explorer, was born near the town. At Dartmouth, in 1190, the Crusaders, under Richard Cœur de Lion, embarked for the Holy Land. Its earliest known charter dates from the fourteenth century. The French burned the town in the time of Richard II., but were repulsed in another attack on it in 1404. In the Civil War of the seventeenth century, it was captured by the Royalists under Prince Maurice, and retaken by the Parliamentarians under Fairfax.

DARTMOUTH COLLEGE. A leading American college situated at Hanover, N. H. Dartmouth originated in Moor's Indian Charity School, organized about 1750 at Lebanon, Conn., by the Rev. Eleazer Wheelock, and receiving its name and first endowment from Joshua Moor or More, in 1755. Support for the school came from gifts made chiefly by the General Courts of Massachusetts Bay and New Hampshire, and by persons in England interested in the project of educating the Indians. This interest was fostered by Sampson Oocoom, an Indian preacher and pupil of Dr. Wheelock, who toured England and Scotland in 1766-67, raising funds for the school. The proceeds, some £10,000, were intrusted to a board of trustees, of whom the Earl

of Dartmouth was chairman. Encouraged by this success, plans were made for the enlargement of the school, so that both whites and Indians might be taught, and for placing it upon a legal and permanent basis. Largely through the influence of John Wentworth, Governor of New Hampshire, large tracts of land were given by that province on the present site of the college, and in 1769 George III. granted a royal charter to 'Dartmouth College'—named in honor of its patron, the Earl. At the same time, Moor's School was made a separate institution, though under the control of the same trustees as those of the college. This school was maintained until 1849, and still retains a legal if fictional existence under the title 'The President of Moor's Charity School.' Dr. Wheelock was made the first president of the college and retained office until 1779, when he was succeeded by his son John. In 1816, a religious controversy having arisen, the Legislature of New Hampshire passed acts intended to deprive the trustees of authority and to take to itself the control of the institution. These acts were sustained by the State court, but were, in 1819, upon argument by Daniel Webster (q.v.), invalidated by the Supreme Court of the United States, which declared the original charter to constitute an inviolable private trust. (See DARTMOUTH COLLEGE CASE.) Dartmouth comprises the college; the Medical School, founded in 1798; the Thayer School of Civil Engineering, founded 1867; and the Amos Tuck School of Administration and Finance, founded in 1900. The Chandler School of Arts and Sciences, founded in 1851, was merged into the college in 1893 as the Chandler Scientific Course. In 1866 the New Hampshire College of Agriculture and Mechanic Arts was established by the State in connection with Dartmouth, but was separated from the college in 1893, and moved to Durham, N. H. The course of the Medical School is four years, and that of the Thayer and Amos Tuck Schools, two years; but the first year in any of the graduate schools may, under certain restrictions, be credited also as the last year in the undergraduate school.

Degrees are conferred in arts, letters, science, civil engineering, and medicine. The college buildings, numbering some twenty-five, include laboratories, an observatory, a medical building, dormitories, a large dining-hall, and commons. There is, besides, the Mary Hitchcock Memorial Hospital, having lecture and clinic facilities at the disposal of the Medical School. The library represents the accumulations of a century and a quarter, and consists of some 90,000 volumes and 20,000 pamphlets. The student enrollment in 1902 was 768, of whom 72 were in the Medical School, 36 in the Thayer School, and 27 in the Amos Tuck School. The presidents of the college have been: Eleazer Wheelock, 1769-79; John Wheelock, 1779-1815; Francis Brown, 1815-20; Daniel Dana, 1820-21; Bennett Tyler, 1821-28; Nathan Lord, 1828-63; Asa Dodge Smith, 1863-77; Samuel Coleord Bartlett, 1877-92; William Jewett Tucker, 1893—.

DARTMOUTH COLLEGE CASE. One of the most important cases in constitutional law ever decided by the United States Supreme Court. The charter of Dartmouth College was granted by the British Crown in 1769, incorporating twelve persons by the name of the Trus-

tees of Dartmouth College, and giving them full power to govern the college and to fill all vacancies in their body. In 1816 the Legislature of New Hampshire passed an act amending the original charter, providing for the appointment of eleven new trustees by the Governor of the State, and for a board of overseers to inspect and control the conduct of the trustees. The old trustees refused to accept the amended charter, and brought suit against the officers of the new board who had obtained possession of the college property. The Supreme Court of New Hampshire upheld the constitutionality of the statute, and the case was then taken on writ of error to the Supreme Court of the United States. For the plaintiffs the main argument was made by Daniel Webster (q.v.), and for the defendants by William Wirt (q.v.), Attorney-General of the United States. In its decision, handed down in 1819, and in which all but one of the justices concurred, the court held, through Chief Justice Marshall, that the acts of the New Hampshire Legislature in question were unconstitutional and void. The college was declared to be a private and not a public corporation; the charter of such a corporation was declared to be a contract between the Crown (to whose obligations the State of New Hampshire had succeeded) and the corporators and their successors, and the State statute which attempted to change the charter without the consent of the corporation was held to be within the prohibition of the Federal Constitution, that "no State shall . . . pass any . . . law impairing the obligation of contracts." The consequences of this decision have been very far-reaching, both in securing the inviolability of private trusts, and in limiting State sovereignty and extending, through the Federal courts, the authority of the Federal Constitution. The principles of the decision have been applied frequently both by Federal and State courts. The case is reported in 1 *New Hampshire Reports*, 111., and 4 *Wheaton (United States) Reports*, 518. For favorable comments on the decision, consult: Kent, *Commentaries on American Law*, vol. i. (Boston, 1884), Lect. xix.; Story, *Commentaries on the Constitution of the United States*, vol. ii. (Boston, 1891); Pomeroy, *Introduction to the Constitutional Law of the United States* (9th ed., Boston, 1886); Maine, *Popular Government* (London, 1885). For a searching criticism of the case, consult Shirley, *The Dartmouth College Causes* (Saint Louis, 1879).

DARU, dá'ru', PIERRE ANTOINE NOËL BRUNO (1767-1829). A French historian, poet, and statesman, born at Montpellier, January 12, 1767. He entered the army in 1783, was imprisoned (1792-93) on a charge of treason to the Republic for eighteen months, during which he produced a highly esteemed translation of Horace. Under the Empire he served with distinction as soldier and diplomat, and during the Restoration was made intendant-général by Louis XVIII. in 1814. At the second Restoration he retired for a time (1815-19) to private life and study, but was made member of the Chamber of Peers in 1819 and became a distinguished defender of constitutional liberty. He died on his estate, near Meulan, September 5, 1829. His *Histoire de la république de Venise*, and *Histoire des ducs de Bretagne* (1826), are impartial, erudite, and accurate. His occasional verses are

unimportant. Sainte-Beuve devotes three articles to him in the *Causeries* (vol. ix.). A *Life* by Viennet is prefixed to the fourth edition of *Histoire de la république de Venise* (Paris, 1853).

D'ARUSMONT, dá'rus'món', FRANCES. See WRIGHT, FANNY.

DAR'WEN. A town of Lancashire, England, situated amid moorland hills, 3½ miles south of Blackburn and 18 miles northwest of Manchester (Map: England, D3). It owes its importance to a trade with India and China in calicoes, for which it employs a large number of spindles and looms. The 'India Mill,' one of the finest in the country, covers an area of 31,000 square feet. The town also contains paper-staining works, paper-manufactories, calico-printing establishments, works for the manufacture of fire-bricks, tiles, and sanitary tubes, iron and brass founding, bleaching, machine and reed making. Coal-mines and stone-quarries also find employment for a considerable number of the inhabitants. It has numerous places of worship, large and commodious schools for elementary education, and a coöperative public hall. The municipality is enterprising and owns gas, water, electric-lighting supply, tramways, slaughter-houses, markets, public baths, free library, technical school, cemetery, artisans' dwellings, and lodging-house, and a modern system of sewage disposal for fertilizing purposes. The place was known as Over Darwen from the reign of Henry II., and with several hamlets was incorporated in 1878 as the municipal borough of Darwen. Population, in 1851, 11,702; in 1891, 34,192; in 1901, 38,200. Consult Shaw, *History of Darwen* (London, 1891).

DARWIN, CHARLES ROBERT (1809-82). The greatest English naturalist of the nineteenth century. He was born at Shrewsbury, February 12, 1809, the son of Dr. Robert W. Darwin, F.R.S., and grandson of Erasmus Darwin (q.v.). His mother was a daughter of Josiah Wedgwood, the famous manufacturer of pottery. After attending a public school at Shrewsbury for some years, he studied at Edinburgh University for two sessions, and then at Christ College, Cambridge, where he took his degree of B.A. in 1831. His father had originally intended him for the Church, but hereditary tendencies toward natural history led him in another direction. Shortly after graduation he seized an opportunity to go around the world as naturalist in H. M. S. *Beagle*, commanded by Captain Fitzroy, R.N. This expedition, which continued from December 27, 1831, to October 2, 1836, and spent much time in making surveys of southern South America, afforded Darwin a great opportunity for making original observations and for contemplation. It was, indeed, his studies on the fauna of the Galapagos Islands that planted the germ of his evolutionary studies. The account of his voyage, finally (1860) entitled *Voyage of a Naturalist on H. M. S. Beagle*, which has passed through many editions, is a classic work, and shows a degree of intelligence in the author that promised great things for his future. This voyage had a marked effect on Darwin's health, leaving him with a tendency toward nausea which during life permitted of only a limited amount of work each day. In the seclusion of his country place at Down, the great thinker was

able, by steady application, despite his disability, to produce his great works.

The scientific outcome of his voyage was a series of important books. In 1839 was published his first *Journal of Researches*; and in 1840-43 the *Zoology of the Voyage of H. M. S. Beagle*, published by the Government and edited by Darwin; in 1842 *The Structure and Distribution of Coral Reefs*, in which was proposed the theory of the origin of coral reefs that is most generally held to-day; in 1844, *Geological Observations on Volcanic Islands*; and in 1846, his *Geological Observations on South America*. Darwin's valuable *Monograph of the Cirripedia* (1851-55) was the immediate outcome of his voyage, and remains to-day the standard systematic work on this group.

It had long been known to a number of scientific friends that Darwin was working on a theory of evolution when, in 1858, he received from A. R. Wallace, then in the East Indies, the manuscript of a paper containing precisely the same explanation of adaptation that Darwin had hit upon. Darwin was naturally much embarrassed, but seemed willing to throw aside the work of years and give precedence to his friend's paper. On the advice of friends, however, his paper and Wallace's were read at the same meeting of the Linnean Society of London, and were published in their *Transactions* for 1858. In 1859 Darwin's book, *The Origin of Species by Means of Natural Selection, or the Preservation of Favored Races in the Struggle of Life*, appeared. It at once created the greatest interest, and, largely through the extraordinarily able championship of Huxley, its ideas soon gained widespread acceptance. Although Darwin's theory of natural selection is primarily only an explanation of adaptation, yet adaptation is of such fundamental importance that its explanation paved the way for the acceptance of the general theory of evolution; for Darwin contributed a mechanical or natural explanation of what had before required a supernatural explanation. Development by natural law took the place of the special-creation hypothesis. Darwin's mechanical theory is that of the struggle for existence, the annihilation of the unfit, and the consequent "survival of the fittest." It rests upon the evident fact that every species of animal produces more young than will develop to maturity and breed; for if all the young produced by any species bred the world would soon become filled with that species to the exclusion of every other. The vast number of individuals that are killed off are, on the whole, below the average of those that survive. The latter have been preserved on account of a certain, perhaps slightly, greater fitness to their environment, which may protect them from their enemies or give them greater power in gaining food or reproducing their kind. Their slight advantage will be inherited, and so the next generation will start from a fitter plane, and by a continuance of the selective process in successive generations, perfect adaptation will result. The theory of natural selection has been subjected to the most rigorous criticism, but it still remains a useful explanation of certain phenomena. See NATURAL SELECTION; EVOLUTION.

The importance of the change wrought by Darwin's book cannot be overestimated. First, it revolutionized the method of work and the

aims of natural history. The aims of zoölogical investigation were thenceforth the retracing of zoölogical *history*, determining the stages through which plants and animals have passed in their development. Before Darwin's time systematic work was the mere enumeration of species; since, it has been the study of relationships. Before Darwin, embryology was the description of the earlier stages of development; since, it has been the reading of the phylogeny in ontogeny. Before Darwin, comparative anatomy was the comparison of types; since then it has become the study of the effect of function and environment in molding the bodily form.

But the influence of Darwinism was by no means confined to natural history. Darwin himself early extended his general theory to man, especially in *The Descent of Man and Selection in Relation to Sex* (1871). Thus extended, Darwin's theory came into opposition to the Bible, literally and narrowly interpreted, and so it aroused a vast storm of opposition from Church officials. In fullness of time not only ecclesiastics but philosophers of every sort have come to base their teachings and doctrines on evolution. Darwin taught that the mind of man in its lowest stages was essentially an animal mind, and the upward progress of man is viewed as effected by natural causes, chief among which is the action of natural selection. He does not inquire into the exact way in which the mental and bodily are connected. He simply assumes that, just as the bodily organism is capable of varying in an indefinite number of ways, so may the mental faculties vary indefinitely in correspondence with certain physical changes. In this way he seeks to account for all the higher mental powers, as the use of language and reason, the sentiment of beauty, and conscience. Finally, Darwin seeks to give a practical and ethical turn to his doctrine, since he defines the general good—the proper object of man's action—as "the rearing of the greatest number of individuals in full health and vigor, and with all their faculties perfect under the conditions to which they are subject." It is well to observe that if Darwinism confined itself to a strict following of the great investigator, it might involve less of philosophic and metaphysical theory than has become popularly associated with it, for much of which Darwin is not to be held responsible. For further exposition of Darwin's views, see EVOLUTION AND NATURAL SELECTION, and the discussion of special phases of his doctrine and investigations under other titles there indicated.

Darwin's later life was devoted to the demonstration of his theory by a series of studies, the results of which appeared chiefly in the following books: *Fertilization of Orchids* (1862); *Variation of Animals and Plants Under Domestication* (1868); *Expression of the Emotions in Man and Animals* (1872); *Insectivorous Plants* (1875); *Climbing Plants* (1875); *The Effects of Cross and Self Fertilization in the Vegetable Kingdom* (1876); *Different Forms of Flowers in Plants of the Same Species* (1877); *The Power of Movement in Plants* (1880); and *On the Formation of Mould by the Action of Earthworms* (1881).

Personally Darwin was characterized by a kind disposition, gentle manners, and brilliant conversational qualities. His warm-heartedness,



CHARLES DARWIN
FROM A PHOTOGRAPH

Ch. Darwin

added to his genius, made for him strong friends, many of whom were of great assistance to him in gaining an acceptance of his theories. His methods of study were interesting. He was a voluminous gatherer of notes on topics which interested him; in experimentation he was quick in his movements and accurate. As in the case of many other leaders of science, his brain was fertile in hypotheses, which were readily rejected when experiment had shown them to be faulty. Although his correspondence was voluminous, he attended to it all with scrupulous care, replying courteously even to a request from a young man who was preparing a lyceum lecture for an abbreviated statement of his views, as the writer had no time to read his books.

He died April 19, 1882, full of years and honors. He was awarded the Prussian Order *Pour le Mérite* (1871), and was made a member of the French Academy in 1878.

Consult *Life and Letters of Charles Darwin*, including an autobiographical chapter, edited by his son, Francis Darwin (3 vols., London, 1887; reprinted in 2 vols., New York, 1893).

DARWIN, ERASMUS (1731-1802). An English physician and naturalist, the grandfather of Charles Darwin. He was born at Elton. He was a keen and philosophic observer of nature, and embodied much of his observations and thoughts in didactic verse, which form several long poems, whose style is stilted and fancifully elaborate. The principal of these is *The Botanic Garden* (1789), of which the second part, entitled "The Loves of the Plants," became famous, and was translated into French and Italian. It contained many suggestions as to 'protective mimicry' and other features afterwards a part of the elaborated doctrine of the evolution of plants. In 1794-96 was published his *Zoönomia*, in prose, which was primarily a medical work, but contained many more general reflections, and received wide notice. Its ideas were so novel and revolutionary that, according to Samuel Butler, Paley's *Natural Theology* was aimed at it and extinguished for a time its influence. Charles Darwin wrote of it, in his *Origin of Species*: "It is curious how largely my grandfather anticipated the views and erroneous grounds of opinion of Lamarck;" and modern students see also that he anticipated much that Charles Darwin himself advanced to acceptance. Erasmus Darwin's views on evolution include the belief that all animals have originated from a single living 'filament'; that changes are produced by differences of climate; that all animals undergo constant changes, and that many of their acquirements are transmitted to their posterity; that the contests of the males for the possession of the females lead to such results as were afterwards stated under the name of 'sexual selection'; that many structures have been acquired as a means of security in a struggle for existence; and that a vast length of time has elapsed since these modifications began. The debt which Charles Darwin, Lamarck, and other exponents of the doctrines of organic evolution, owe to Erasmus Darwin has been carefully considered by Packard in his biography of *Lamarck* (New York, 1901), and by Krause in *The Scientific Works of Erasmus Darwin* (1879); also by Butler, *Evolution, Old and New* (London, 1879). A meagre biography by Anna Seward was published in London in

1804. Dr. Darwin's last work was *Phytologia, or the Philosophy of Agriculture and Gardening* (1799), in which he expresses a belief that plants have sensation and volition. He died at Derby. See EVOLUTION.

DARWIN, FRANCIS (1848—). An English botanist, a son of Charles Robert Darwin, born at Down, in Kent. He received his education at Trinity College, Cambridge, studied medicine at Saint George's Hospital in London, assisted Charles Darwin at Down, and in 1888 was made reader in botany at the University of Cambridge. Besides a number of interesting papers on special botanical topics, he published the following works: *Life and Letters of Charles Darwin* (1887); *Charles Darwin* (1892); *Practical Physiology of Plants*, jointly with Acton (1894); *Elements of Botany* (1895). Charles Darwin's *Practical Physiology of Plants* was prepared with the son's aid.

DARWIN, GEORGE HOWARD (1845—). An English geologist, son of Charles Robert Darwin. He was born at Down, Kent, and after graduating at Trinity College (1868), where he was later a fellow (1868-78), he was admitted to the bar. He did not practice, however, but devoted his entire attention to mathematical science, and particularly to experimental investigation on the pressure of loose sands, on changes in the level of the earth's surface, and minor earthquakes. His publications include papers on *The Harmonic Analysis of Tidal Observations* (1883); *The Effects of Tidal Friction on the Earth and Moon*; *Periodical Orbits* (1896); and *Tides and Kindred Phenomena* (1898). In 1882 he assisted Sir William Thomson in the preparation of a new edition of Thomson and Tait's *Natural Philosophy*. He was appointed Plumian professor of astronomy and experimental philosophy at Cambridge in 1883. Mr. Darwin was chosen a member of the Royal Society, and in 1885 became a member of the council of the Meteorological Office.

DARWIN, MOUNT. A mountain of Tierra del Fuego, South America, above 6000 feet in altitude (Map: Chile, D 14). It is named after Charles Darwin.

DARWINISM. See DARWIN, CHARLES; EVOLUTION; and NATURAL SELECTION.

DASE, dä'zē, JOHANN MARTIN ZACHARIAS (1824-61). A mathematical prodigy, born in Hamburg. When a boy he gave public exhibitions as an expert calculator. One of his feats was the rapid multiplication of a series of fifty figures or more by another series of equal length; and he is said to have been equally expert in extracting the cubic root of numbers containing from 80 to 100 figures—a task he frequently performed in less than an hour. He wrote *Tafeln der natürlichen Logarithmen der Zahlen* (Vienna, 1850), and *Factoren-Tafeln für alle Zahlen der siebensten Million, oder genauer von 6,000,001 bis 7,002,000 mit den darin vorkommenden Primzahlen* (1862-65).

DASENT, dä'sent, SIR GEORGE WEBBE (1820-96). An English scholar and author, born at Saint Vincent, West Indies. He was educated at Oxford, was appointed civil-service commissioner in 1870, and in the following year assumed the editorship of *Fraser's Magazine*. He was also associated for some time with the Lon-

don *Times*, and edited the valuable lexicographical work entitled *Icelandic-English Dictionary* (1874). In addition to a translation of *The Younger Edda* (1842), he wrote the following: *The Norsemen in Ireland* (1855); *The Story of Burnt Njal* (1861); and *Selection of Norse Tales* (1862). His fascinating narrative entitled *Annals of an Eventful Life* passed through five editions (latest ed., 3 vols., 1870).

DASH, dāsh, LA COMTESSE (Fr., Countess Dash). The *nom-de-plume* of Gabrielle Anne de Cisterne de Courtiras, Marquise de Saint-Mars, a French novelist.

DASHKOFF, dāsh'kōf, EKATERINA ROMANOVNA, Princess (1743-1810). A prominent figure in Russian political and literary circles during the latter half of the eighteenth century. She was the daughter of Count Vorontsoff, and was born March 28, 1743. At the age of fifteen she was married to Prince Dashkoff, an officer of the Imperial Guard. As lady-in-waiting and intimate friend of the Grand Duchess Catharine, the Princess appears to have taken an extraordinarily active part in the conspiracy of 1762, which resulted in placing her mistress on the throne as Catharine II. (q.v.). Prince Dashkoff died in 1761, and his widow gave herself up to her children, to literature, and to politics. A coldness between herself and the Empress now ended in a quarrel and in her retirement from the Court. After an extended tour through Germany, England, France, and Italy, during which she met almost all the great literary men of the day, the Princess returned to Russia in 1782, and was at once restored to Imperial favor. She was appointed director of the Russian Academy of Science, and in 1783 became first president of the Russian Academy, which was established through her efforts. On the death of Catharine II., in 1796, she was deprived of her offices, and ordered by Paul I. to retire to her estates at Novgorod. Later on she was allowed to reside in Moscow, where she died on January 16, 1810. In literature the Princess is remembered as the writer of several comedies, and as being mainly instrumental in inducing the Russian Academy to draw up a dictionary of the Russian language. The work was completed under her direction, and was in part written by her. Her memoirs have been edited by Mrs. W. Bradford (London, 1840).

DASHT, dāsht, or **DESHT**, dēsht. A river of Baluchistan, Asia, running through the southwestern portion of the country and falling into the Arabian Sea near the Persian border (Map: Persia, H 7). Its northern branch, the Nibing, forms a part of the boundary between Baluchistan and Persia. The combined rivers are 175 miles long.

DASHWOOD, ELINOR and MARIANNE. In Jane Austen's *Sense and Sensibility*, two sisters typifying the two opposite qualities.

DASS, dās, PETER (1647-1708). The father of modern Norwegian poetry. He was born at Nord-Herø, the son of an immigrant Scotch merchant and a Norse woman of good breeding. He attained in the Church a position of dignity, responsibility, and some danger, on the north coast of Norway, where with brief intermissions he lived peacefully and wrote unremittingly verses and a garrulous *Autobiography*. His work

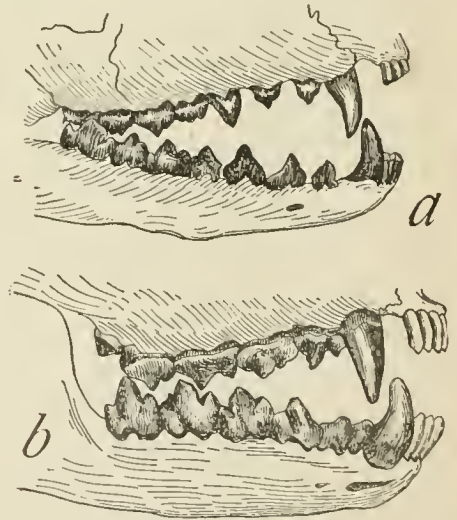
circulated in manuscript, but little was printed in his lifetime, and the first collection of his *Works* was by Eriksen (Christiania, 1874-77). *The Northland's Trumpet*, his most famous poem, was not printed till 1739. This rhyming description of land and people, quaint, witty, fanciful, and in an unforgettable lilting measure, is known by heart throughout northern Norway. Note-worthy, too, are the *Valley Song* (1696), and *Spiritual Pastime* (1711), a collection of religious verse.

DAS'SIE, or **DASSY** (South African). A familiar diminutive in Cape Colony of the local Dutch name *Klip-das* for the South African hyrax (*Procavia Capensis*), also called rock-rabbit by English colonists. See **HYRAX**.

DASTRE, dās'tr', FRANK ALBERT (1844—). A French physiologist, born in Paris. He studied at the Ecole Normale Supérieure, of which he became fellow, and was appointed professor of natural history at the Lycée Louis-le-Grand. In 1887 he was called to the chair of physiology at the Sorbonne. He translated S. Weir Mitchell's *Injuries of Nerves, and Their Consequences* (1872), as *Des lésions des nerfs, et de leur conséquence* (1873), and wrote *Rôle physiologique du sucre de lait* (1882); *Recherches expérimentales sur le système vaso-moteur* (with Morat, 1884), and other scientific works.

DASYPÆDES, dās'i-pē'dēz. See subtitle *Plumage*, in the article **BIRDS**.

DASYURE, dās'i-ūr (from Gk. *δαρύς*, *dasys*, shaggy + *οὐρά*, *oura*, tail). A marsupial of the family Dasyuridae, which includes various highly generalized carnivorous and insectivorous forms of Australasia allied to the opossums, and closely representative of Tertiary forms found fossil in South America and elsewhere. Their hind and fore limbs are approximately equal,



DENTITION OF DASYURES.

a, Tasmanian wolf (*Thylacinus*); *b*, Tasmanian devil (*Sarcophilus*).

and the toes (of which the second and third of the hind feet are entirely free) are well developed and clawed; their tails are long, hairy, curling, and not prehensile; their dentition is

carnassial, the canines often being large tusks, and there are eight large incisors in the upper jaw; and a cæcum is lacking. Many of the dasyures are strong, fierce, cat-like beasts of prey, scattered over Australia, New Guinea, and especially prevalent in Tasmania, where, as also in southeastern Australia, they have become rare owing to the war made upon them by the colonists. All are mainly terrestrial and live in burrows.

Prominent among these beasts is the thylacine, or Tasmanian zebra-wolf or pouched dog (*Thylacinus cynocephalus*). It is very wolf-like in appearance, but somewhat smaller than the common wolf, with shorter hair, a long terete, comparatively smooth tail, and more rounded ears. Its color is grayish-brown, with the hinder part of the back and root of the tail barred with blackish stripes diminishing to points on the flanks. It dwells in rocky dens, seeks its prey at night, and until reduced in numbers was a destructive pest to the flocks of sheep.

Another is the ferocious Tasmanian devil (*Sarcophilus ursinus*), which is a heavy, powerful, long-furred, almost black animal resembling a bear, but only about the size of a badger, and having a long, thick tail. It also is decidedly nocturnal, sleeping by day in some dark lair or burrow, and attacking sheep and lesser prey by night, nothing being safe from its strength and ferocity; but this pest is now nearly exterminated.

On the continent of Australia several very cat-like or civet-like dasyures occur, of which the handsomest is the spotted 'native cat,' nearly as large as a house cat; but some of this genus (*Dasyurus*) are much smaller. To the genera Phascologale and its allies belong a variety of small insect-eating dasyures greatly resembling rats and mice in their appearance, and living mainly on insects, birds' eggs, etc.; and another now very rare form (*Antechinomys laniger*) has much the form and appearance of a jerboa. Finally there must be mentioned the banded ant-eater (*Myrmecobius fasciatus*), "which derives its special interest from the circumstance that it comes closer to some of the extinct marsupials of the Secondary rocks of Europe than does any other living type." This animal is about the size of a squirrel, but has a viverrine form and long, somewhat bushy, tail. In many of the dasyures the pouch is rudimentary, but here the female has no pouch, "the young, when first born, being merely concealed by the long hair of the belly as they cling to the teats (four in number)." Its teeth are all small and adapted to eating the insects that constitute its fare—mainly ants and termites, which are gathered by the long and protrusile tongue. Hence it is found chiefly in the sandy plains of southern and western Australia, where it dwells in the hollows of ant-hills and similar retreats. Its general hue is white beneath, and on the upper part dark chestnut-red marked by broad transverse bars of white. See MARSUPIALIA; and Plate of PHALANGERS.

DATE. See CALENDAR; CHRONOLOGY.

DATE, and **DATE-PALM** (OF. *date*, *datil*, *datille*, Fr. *datte*, from Lat. *dactylus*, Gk. *δάκτυλος*, *daktulos*, finger, date; so called from the shape). The common date of commerce is the fruit of the date-palm (*Phoenix dactylifera*). Besides this

there are several other species which bear fruits of more or less value, but none rank in importance with *Phoenix dactylifera*. This plant is a native of the southwest of Asia and the northern half of Africa, finding its most congenial home and most extensive cultivation in Arabia. The plant is also cultivated in China, in France, Italy, and, very sparingly as yet, in the United States. California, however, promises to become a commercial date-producing section.

The date is borne on one of the tree-palms, although many of the representatives of the genus *Phoenix* are low-growing plants. The date-palm is a tree ranging from 40 to 100 feet in height, bearing a dense head of pinnated leaves several feet in length. The plant is dioecious, the staminate flowers being borne on one plant, while the pistillate ones are borne by another individual. This peculiarity is well understood by the natives, who cut off the staminate flower clusters and place them in the pistillate trees to insure fertilization. Since each tree reproduces its sex in the sprouts or suckers from its base, date orchards or plantations are made up of the young plants taken from the roots of bearing trees, with only a sufficient number of staminate plants to insure fertilization. The date enjoys a hot, bright, sunny situation, thrives on soils too alkaline for other vegetation, but must have water within reach of its roots. The bearing age is reached in about eight years, and as the plants are long-lived and frequently bear as much as 300 to 500 pounds of fruit in a season when at full bearing, they become enormously profitable; in fact, the date is the chief source of wealth for Arabia, and is used as the staple food by caravans crossing the great desert. The fruit possesses a high food value, being chiefly composed of sugar, together with pectin, gum, and proteids. The fruits are eaten both fresh and dried. The seeds when roasted form a substitute for coffee, and when ground yield a valuable oil, as well as a pomace used as a cattle food. Beside these products the tree itself yields in its leaves materials for baskets and wickerwork; the trunk yields a fibre from which twine and rope can be made; an edible bud known as 'palm cabbage' is produced at the crown of the tree, and the wood is used for fencing and for the construction of light shelter. Besides these economic uses, the date-palm has long figured conspicuously in religious services among Jews and Christians, as well as among pagans. The *palm-tree* of the Scripture is *Phoenix dactylifera*, and Christ's triumphal entry into Jerusalem is to this day celebrated on Palm Sunday. It has other symbolic meanings; to the Hebrews and Hellenes it stood as the symbol of beauty and of victory. See Plate of MONOCOTYLEDONS.

DATE LINE. See INTERNATIONAL DATE LINE.

DATE-PLUM. See PERSIMMON.

DATE-SHELL, or **DATEFISH** (so named from its shape). (1) A shell of a small bivalve mollusk or datefish of the genus *Lithodomus* (or *Lithophagus*), closely allied to the horse-mussel (*Modiolus*), which burrows deeply into calcareous rocks, the shells of larger mollusks, etc. One species (*Lithodomus lithophagus*) abounds in the Mediterranean, and is of interest mainly because of its perforations of certain columns of

the ancient Temple of Serapis at Pozzuoli (ancient Puteoli), a few miles west of Naples, Italy. These columns are of African marble, and several centuries ago were carried by the sinking of the ground below the level of the sea, which overflowed the site of the ruins and submerged the pillars to the height of 13 feet, exposing them to attack by these mollusks, which burrowed into them in large numbers. Subsequently they were slowly elevated (probably about the end of the fifteenth century) and have since been above the water. The method of boring rocks is not thoroughly understood, but is thought to be mainly by abrasive movements of the foot. (2) In California, an edible bivalve mollusk (*Zirphæa crispata*) related to the piddock (q.v.).

DATI, dā'tē, CARLO ROBERTO (1619-75). An Italian philologist and writer, born in Florence. His many curious and interesting books include: *Discorso dell' obbligo di ben parlare la propria lingua* (1657); *Lettera a Filatele* (1663); *Vite de' pittori antichi*, dedicated to Louis XIV. (1669); and *Due novelle* (1863).

DATIA, dāt'ē-ā. The capital of the principality of the same name in Central India (Map: India, C 3). It stands on a rocky height surrounded by a stone wall. The chief of the Datia State dwells here. West of the town rises a palace of immense size and remarkable beauty; and there are interesting Jain temples, four miles distant. Population, in 1891, 27,566; in 1901, 24,071.

DA'TIS (Lat., from Gk. Δάτις, from Pers. *Dātrēh*, good according to the law, from *dat*, OPers. *dāta*, law + *rēh*, Av. *rohu*, good). A Persian general of the fifth century B.C. In conjunction with Artaphernes, he commanded the army of Darius which was defeated at Marathon by Miltiades (B.C. 490). Afterwards he was put to death by the Spartans.

DATIVE. See DECLENSION.

DAT'OLITE, or **DATH'OLITE** (Gk. *δατέλιθον*, *datēlisthai*, to divide + *λίθος*, *lithos*, stone; referring to its granular structure). A boron and calcium orthosilicate that crystallizes in the monoclinic system. It is usually found in the form of glassy, greenish crystals, but sometimes has a yellow or reddish tinge. Datolite usually occurs in veins and cavities in basic eruptive rocks, often with calcite, prehnite, and the zeolites. It is found in Scotland, Norway, Sweden, and various places on the Continent. In the United States it occurs at Bergen Hill and Paterson, N. J.; in Connecticut and Massachusetts, and in the Lake Superior region. The crystals take a high polish and have been cut as opaque gems or ornamental stones.

DATU'RA. See STRAMONIUM.

DATU'RINE. See ATROPINE.

DAUB, doup, KARL (1765-1836). A German speculative theologian. He was born at Cassel and educated at Marburg, where he was tutor for a time; became professor of philosophy at Hanau in 1794, and soon afterwards of theology at Heidelberg, where he remained until his death. His writings, based on the philosophies, successively, of Kant, Fichte, Schelling, and Hegel, were once important for their argumentative method, but are no longer much read. The principal ones are: *Lehrbuch der Katechetik* (1801); *Theologemena* (1806); *Einleitung in das Studium der*

Dogmatik (1810); and *Die dogmatische Theologie jetziger Zeit oder die Selbstsucht in der Wissenschaft des Glaubens* (1833).

DAUBAN, dō'bān', JULES JOSEPH (1822—). A French painter. He was born in Paris, and studied there under Auguste Delbay. He became director of the School of Fine Arts at Angers in 1849, and was made a member of the Legion of Honor in 1868. Among his works are "Trappists Receiving a Stranger" (1864), in the Luxembourg; "Trappists Exchanging the Kiss of Peace" (1865), in the Angers Museum; and "Fra Angelico da Fiesole" (1873). He produced several decorative paintings in the theatre and hospital at Angers, and in the Church of Saint Louis-en-l'Isle, Paris. Despite a certain coldness of color, his compositions are dignified and impressive.

DAUBENTON, dō'bān'tōn', LOUIS JEAN MARIE (1716-99). A French naturalist, born at Montbar, May 29, 1716. In 1742 he became associated in Paris with Buffon in the preparation of the latter's great *Histoire naturelle*, for which he furnished the anatomical descriptions relating to mammals. In 1745 Daubenton became curator and demonstrator of the cabinet of natural history of the Académie des Sciences, and in 1778 professor in the Collège de France. He wrote voluminously, and has been especially influential in the science of herpetology. He died in Paris, December 31, 1799.

DAUBER, dab'ēr, or MUD-DAUBER. See MUD-WASP.

D'AUBIGNÉ, dō'bē'nyā'. See MERLE D'AUBIGNÉ.

D'AUBIGNÉ, THÉODORE AGRIPPA (1550-1630). A Protestant historian, poet, and soldier, born near Pons in Saintonge, France, February 8, 1550. He was educated at Geneva. Latin, Greek, and Hebrew were familiar to him from his earliest youth, and at seven years of age he is said to have made a translation of Plato's *Crito*. His father had inspired him with an enthusiasm for the Huguenot cause, and he was present at the siege of Orléans in 1563, when the elder d'Aubigné was slain. The son played a prominent part in the religious wars preceding the accession of Henry of Navarre. Though opposed to that prince's conversion, he consented to serve him, and was made vice-admiral of Guienne and Brittany. D'Aubigné was famous for his rough wit and frank speech, and he did not hesitate to use the most outspoken sarcasm against the King and other members of the royal family. The assassination of Henry IV., in 1610, caused D'Aubigné to retire to his estates, and later he took up his residence at Geneva. There he employed himself in literary work and in furthering the cause of Protestantism, in every way possible. His last years were embittered by the conduct of his son Constant, who betrayed the trust reposed in him by the Huguenots. This son was the father of the Duchesse de Noailles and of Madame de Maintenon. D'Aubigné died April 29, 1630, leaving as his literary legacy a number of works, of which the following deserve mention: *Histoire universelle 1550-1601*; *Confession catholique du Sieur de Sancy*; and *Aventures du baron de Fancoste: histoire secrète écrite par lui-même*. These, with others of less importance, will be found in *Œuvres complètes de Th. d'Aubigné*, edited by MM. Reaume and de Caussade, which

also contains *Sa vie et ses enfants*, the best biography; consult, also Réaume, *Etude historique et littéraire sur A. d'Aubigné* (Paris, 1883).

DAUBIGNY, dô'bényé', CHARLES FRANÇOIS (1817-78). A French landscape painter, born in Paris on February 15, 1817. His father was a teacher of drawing and a painter who occasionally exhibited at the Salon. Charles François was brought up by an old nurse at Valmandois, near He-Adam, where he remained until his tenth year. In this, his childhood home, to which he frequently returned, and where he finally settled, he imbibed his great love for nature. On his return to Paris he helped support the family by painting articles like fans, snuff-boxes, and even business signs. In his seventeenth year he went to Italy with a friend and fellow artist, traveling on foot. He remained there for a year, but was not much influenced by his sojourn. In 1840 he entered the studio of Delaroche, with a view to competing for the Prix de Rome, but having been disqualified, he was thrown upon his own resources. He turned to nature, and was thenceforth a landscape painter. With the exception of the years 1842-46, he exhibited every year in the Salon. He received a second-class medal in 1848, a first-class in 1852, and in 1857 he was made Chevalier of the Legion of Honor. Gratified with his success in painting river scenery, he built a house at Auvers on the Oise, near his childhood home. He constructed a curious boat, the *Botin*, at the same time a house and a studio, in which, accompanied by his son Karl, he navigated at will, sketching river scenery. In 1876 he visited Normandy, bringing back with him many sketches of the sea and the shores of the channel. During the latter part of his life he suffered much from rheumatism contracted on his river trips. He died in Paris on February 20, 1878.

Daubigny was the youngest of the five great landscape painters of the Barbizon School. The rest were perhaps greater discoverers than he. They painted nature with figures as a subordinate incident of the scene, and only adding to the artistic sentiment they wished to express. Daubigny painted the country, that is to say, nature as affected by man, although men do not usually appear in his scenes. There are certain kinds of landscapes which he may be said to have discovered, and which are indissolubly linked with his name. He is the great painter of river scenery of central France, on the Seine, the Marne, and the Oise; of orchards, full of white blossoms or laden with ripe fruit, and of the fields; of the sea and of the shores of the Channel. His favorite light was at dusk, in the cool of the evening, or the pale light of the moon. A delicate shade of vaporous air pervades his paintings; his values are just, and the colors are properly juxtaposed. His paintings do not always present distinctness of outline, for drawing was not his strong point, but the handling is massive and powerful. In his early period he paid more attention to detail, but he increasingly adopted greater breadth of treatment, and his last works may almost be called impressionist.

Among his chief works are the "Valley of Optevoz," which took the gold medal in 1853. In the Louvre are his "Springtime," in which one can fairly smell the apple-blossoms and see the green grass grow, the "Lock of the Optevoz,"

and the "Vintage." Other important works are the "Beach at Villerville" (1859); "Mourise" (1861); "The Sheepfold" (1866); and the "Apple Orchard" (1876), an autumnal scene in which the prevailing tone is a dark, rich green, with apples ripe for the pickers. The chief public galleries of America are well supplied with his works, as are also some of the private collections. Daubigny unfortunately sold to art dealers a large number of works which are little more than sketches. These are frequently met with in picture collections, but no adequate conception of his work can be formed from them. Besides being a great painter, Daubigny was an etcher of repute, especially in the period after his return from Italy.

Consult: Strahan, *History of French Art* (New York, 1900); Hustin, "Daubigny," in *Les Artistes célèbres*; Tryon, "Daubigny," in Van Dyke's *Modern French Masters* (New York, 1896); Henriet, *Daubigny et son œuvre* (Paris, 1878).

DAUBIGNY, KARL PIERRE (1846-86). A French landscape painter, born in Paris, son and pupil of Charles François Daubigny. His pictures, the subjects of which were mostly chosen from the valleys of the Seine and Oise, and the coasts of Brittany and Normandy, bear the impress of his own strong individuality. Among them may be mentioned: "Return from Fishing at Trouville," "The Thames Near Chelsea," "Road from Paris to Fontainebleau," "The Farm of Saint Siméon Near Honfleur," and "Moonrise at Sunset" (1866), his last, and also one of his best, efforts.

DAUBRÉE, dô'bré', GABRIEL AUGUSTE (1814-96). A French geologist and mineralogist. He was born at Metz, and was educated at the Ecole Polytechnique in Paris. In 1838 he was made professor at Strassburg, and in 1861 became a member of the Academy of Sciences in Paris. In Paris he also held a professorship at the Museum of Natural History and at the School of Mines, of which latter he became director in 1872. Besides a very large number of original papers, Daubrée's published works include: *Etudes synthétiques de géologie expérimentale* (1879); *Les météorites et la constitution du globe terrestre* (1886); *Les eaux souterraines* (3 vols., 1877). His original researches resulted in valuable contributions to our knowledge of the mode of formation of various mineral substances and of crystalline rocks.

DAUCUS. See CARROT.

DAUDET, dô'dá', ALPHONSE (1840-97). The most graceful of modern French humorists, the most sympathetic satirist and the most charming, if not the deftest, story-teller of his generation in France. He was a native of Provence, and inherited its warm imagination. He has given us one of the classics of child autobiography in his *Le petit chosé*. His father, a well-to-do manufacturer, suffered a reverse of fortune, and young Daudet, who was already nursing literary dreams, was obliged to accept a post as usher, ill-paid and ill-paid, in a school at Alais. After a year of this mental slavery, he escaped in desperation and joined his equally penniless brother Ernest (q.v.) in Paris (November, 1857). He tried to eke out a livelihood by journalism, contributing prose and verse to the *Figaro* of sound morale and polished workmanship. "His literary conscience," says

his brother, "awoke in him at the same instant as his literary talent," and it never slumbered, even when, as occasionally happened, the talent nodded. "It is style that perfumes a book," he said, and his own had a studied and unique fragrance from the first. Zola describes him at this time as "living on the *Romanée of the Rose*, a love allegory, on the outskirts of the city with other poets, a whole band of joyous Bohemians," whom he was to picture in *Jack*. Yet he lived with them and left them without losing the bloom of his youth, the freshness of his mind, or the straightforwardness of his character. His work attracted notice, and in 1861 Empress Eugénie, fascinated by his poem on *Les Prunes*, induced the Duc de Morny, the Minister of State, to give Daudet a sinecure secretaryship, which he held till Morny's death (1865) and turned to good account in *Le nabab*.

Holding this Government post, he traveled on nominal commissions to Algeria, Corsica, and Sardinia, gaining health and supplementing an always deficient sense of color while he gathered material for Arabian and Corsican stories, used in his *Lettres de mon moulin* and *Contes du lundi*, as well as for his greatest novels, *Numa Roumestan* and *Le nabab*, and for the scenery of the first exploits of his immortal *Tartarin*. He now first learned to know Gambetta, Mistral, and others, from whom he caught the secrets of Provençal character; he attempted the drama, and felt in 1865 sufficient confidence in his literary future to resign his Government position. In 1867 he finished *Le petit ébosc* and married an almost ideal helpmeet—a woman of letters, whose northern French common sense supplemented and directed his southern ardor, compelling him, as it were, to realize the possibilities of his genius. Her influence was obvious in his next book, *Lettres de mon moulin* (1869), which contains some exquisite bits of story-telling in lighter vein. Then came the war with Germany to give his mind a sterner temper. In that terrible year (1870-71) it was that his genius came to full ripeness, which manifested itself first in *Tartarin de Tarascon* (1872). This, with its sequels, *Tartarin sur les Alpes* (1886) and *Port-Tarascon* (1890), is a masterpiece of subtle caricature of the effervescent imagination of Provence, that creates its own environment and yet charms in spite of its own self-deception. A second volume of short stories, *Contes du lundi* (1873), fulfilled his promise of the *Lettres de mon moulin* and added a stronger note in such stories as *La dernière classe*, *Le siège de Berlin*, *Le jeu au billard*, and *Le bac*. Less admirable in tone are the *Lettres à un absent* (1871), now canceled in Daudet's works, and *Robert Helmont* (1874), sketches of wartime, interesting because they contain preliminary studies for *Jack* and *Le nabab*. In 1874 Daudet entered on the high road to fortune as well as fame with his first 'Parisian drama,' the novel *Fromont jeune et Rister aîné*, translated under the name of its feminine incarnation of evil, *Sidonie*. Here, as later, he showed himself an idealistic student of reality, choosing as his scene what he could view from his study window and gathering notes in street and shop and parlor, masses of which are among his literary remains. He had now found a new power and discovered the joy of sustained creative effort. Each novel now marks progress—*Jack* (1876);

Le nabab (1877); *Les rois en exil* (1879); and *Numa Roumestan* (1881). Then comes a change in method with *L'Évangéliste* (1883), no longer a drama, but 'an observation,' a psychic study, a cauterization of cant and hypocrisy, not a novel of action. *Sapho* (1884), too, is more a demonstration than a narration, though some regard it, as did Daudet himself, as the crown of his achievement. It was the last novel written before nervous disease laid hold on him. It is a work of great power, but its realism verges on the pathologic, and its story of facile love, that saps the strength of heart and mind, is disagreeable reading. The novels of Daudet's decline are *L'immortel* (1888), a satire on the French Academy, as inexplicable as it was cruel, with an imputation as improbable as it was unjust; *Rose et Ninette* (1891), a story of divorce; *La petite paroisse* (1895), a study of jealousy. His reminiscences are embodied in *Trente ans de Paris* (1888) and *Souvenirs d'un homme de lettres* (1889). The posthumous *Soutien de famille*, a bitterly sarcastic picture of French political life (1898), and a volume of stories, trivial or saturnine, *La Fédor*, also published after Daudet's death, complete the list.

Since 1885 Daudet had been an intense nervous sufferer, with alternating periods of great activity and dead calm. Death came suddenly at table in the family circle. Daudet had exquisite subtlety rather than forceful virility. He charms by variety and suppleness, and by shifting of scenes and keys. He is more impressionist than logician. He seldom shows more than one side, even of a complex character, and is better with women than men. But though he lacked interpretative insight, he had an acutely sensitive imagination, and was able to give of the society in which he lived the broadest, most varied, and, in the main, most faithful image, while he leaves on his readers the impression of a noble and sympathetic character. There are several translations of Daudet's chief novels and a uniform edition of them (Boston, 1900), with critical introductions. Consult: Léon Daudet, *Alphonse Daudet*, and Ernest Daudet, *Mon frère et moi* (Eng. trans. of them both, Boston, 1898); Brunetière, *Le roman naturaliste* (Paris, 1896); Doumic, *Portraits d'écrivains* (id., 1892).

DAUDET, ERNEST (1837—). A French novelist and historian, born at Nîmes, May 31, 1837. He is a brother of Alphonse Daudet, of whom he wrote an interesting biographical sketch, *Mon frère et moi* (1882), translated as an appendix to *Alphonse Daudet*, by Léon Daudet (Boston, 1898). His noteworthy novels are: *La Vénus de Gordes*; *Fleur de pêché*; *Marthe*; and *La Princesse de Lerici* (1900). He has written also an *Histoire de l'émigration* (1886-90) during the French Revolution, and an *Histoire des conspirations royalistes du midi* (1881) in the same period.

DAUGHTERS OF THE AMERICAN REVOLUTION, SOCIETY OF. A woman's patriotic society, organized in Washington, D. C., October 11, 1890. It has for its objects the perpetuation of the memory of those who achieved American independence, the collection of relics of early American days, and the erection of monuments on historic sites. Membership is restricted to those women of whose access-

tors—at least one aided in establishing American independence. The society has admitted to membership about 40,000 women, organized into some 700 local chapters. These chapters are found in all of the States and Territories excepting Idaho and Mississippi, Nevada, Arizona, and New Mexico, and there are also chapters in Canada, the Hawaiian Islands, and in Europe. Delegates from all the chapters meet in annual congress in Washington in the week of Washington's Birthday. The society has collected many historical relics, which have been deposited in the United States National Museum in Washington, and it has also a valuable historical and genealogical library at its headquarters in Washington. During the Spanish-American War it aided the Government by securing nurses of proper character and qualifications. The society has accumulated a fund of \$125,000, for the purpose of erecting a Continental Memorial Hall in Washington, and in 1902 purchased a site for that purpose. The National Society was incorporated by act of Congress in 1896, and, in accordance with that act, reports annually to Congress. The society publishes *The American Monthly Magazine*, the first number of which was issued July, 1892; and also a series of lineage books, containing the record of the ancestry of each member of the organization.

DAUGHTERS OF THE CONFEDERACY, UNITED. See CONFEDERACY, UNITED DAUGHTERS OF THE.

DAUGHTERS OF THE KING. An organization for women in the Episcopal Church, analogous to the Brotherhood of Saint Andrew. It was organized in New York City in 1885, and its pledge requires that each member shall make an earnest effort each week to bring at least one woman within the hearing of the gospel of Jesus Christ. It holds an annual convention, has headquarters in New York City, and an organ, *The Royal Cross*, and has enrolled upward of 12,000 persons. Members are admitted with a solemn service before the altar, invested with the cross, and pledged by a vow to prayer and service. Consult Bacon and Northrop, *Young People's Societies* (New York, 1900).

DAUGHTERS OF THE REVOLUTION, SOCIETY OF. A woman's hereditary patriotic society organized in New York City in 1891. As originally composed, the society consisted largely of those who had withdrawn from the Society of the Daughters of the American Revolution (q.v.), because that society then admitted to membership women of collateral descent. The patriotic objects of the two societies are similar, but the requirements for admission to the Daughters of the Revolution are the more stringent. They require a member to be the lineal descendant of an ancestor who actively assisted in the establishment of American independence, and who became thereby liable to conviction for treason against the Government of Great Britain. The General Society, which meets annually, is composed of national officers and delegates from the following organized State societies: Colorado, Connecticut, Delaware, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah, Washington, West Virginia, and Wisconsin. The total membership is 4000.

DAULATABAD, dou'la-tā-bād' (Ar., city of prosperity; Hind. *Deogiri*, Skt. *Dēvāgiri*, mountain of the gods, from the cliff which commands the town). A strongly fortified town of India, within the Nizam's dominions, near their north-western frontier, in latitude 19° 57' N., and longitude 75° 18' E. The town is noted for its commanding rock-fortress, which, with a height of about 500 feet, is scarped into a perpendicular for the lowest third of its altitude. This stronghold is all the more formidable from its being completely isolated, being 3000 yards distant from any other eminence. The town has greatly decayed, and has a population of less than one thousand. The famous cave temples of Ellora are within seven miles of Daulatabad.

DAUMER, dou'mër, GEORG FRIEDRICH (1800-75). A German poet and philosophical writer, known also by his pen-name, Eusebius Emmeran. He was born at Nuremberg, studied at the Universities of Erlangen and Leipzig, and, from 1822 to 1830, was a professor in the Nuremberg Gymnasium. He solemnly urged that human sacrifice had attended Hebraic and even primitive Christian rites, and passed in a few years from violent rationalism to ultra-Romanism. His writings, which mirror his peculiarities, include *Die Urgeschichte des Menschengeistes* (1827); *Die Geheimnisse des christlichen Altertums* (2 vols., 1847); *Aphorismen über Tod und Unsterblichkeit* (1865); and *Das Wunder* (1874). For somewhat more than a year he was guardian and instructor of the famous foundling Kaspar Hauser (q.v.), in regard to whom he published *Mittheilungen über Kaspar Hauser* (1832); *Enthüllungen über Kaspar Hauser* (1859); and *Kaspar Hauser, sein Wesen, seine Unschuld* (1873).

DAUMET, dô'má', PIERRE JÉRÔME HONORÉ (1826—). A French architect, born in Paris. He studied at the Ecole des Beaux-Arts, and obtained the Prix de Rome in 1855. Afterwards he accompanied an archaeological mission to Greece under the directorship of M. Henzey. Upon his return he was employed by the city of Paris in the rebuilding of the Palais de Justice. After the death of Viollet le Duc, he was made architect-in-chief for this important work, and completed it. In 1885 he became a member of the Institute and inspector-general of civil buildings. M. Daumet's name became connected with all the architectural societies of interest in France, and he was elected an honorary member of the Royal Society of British Architects. His most notable work is the restoration of the Château de Chantilly for the Duke d'Annamale (1876-81).

DAUMIER, dô'myá', HONORÉ (1808-79). A celebrated French caricaturist, born in Marseilles. Fashion, fiddle-tattle, scandal, politics, blemishes of figure, and oddities of character in turn inspired his genius for mockery. Few among his illustrious contemporaries escaped his pencil. His most celebrated work is the series of "Robert Macaire," published in the *Charivari*, after which followed "Les actualités," "Les divorcés," "Les femmes socialistes," "Les philanthropes du jour," "Les Grecs," "Les gens de justice," "Les bons bourgeois," "Les pastorales," and "Les papas." The Revolution of 1848 suggested two of his most remarkable series—"Idylles parlementaires" and "Les représentants représentés."

He became blind in 1877, and died in 1879 at Valmondois (Seine-et-Oise) in a house given him by Corot, the landscape painter. Consult: Muther. *The History of Modern Painting* (London, 1896); Alexandre, *Honoré Daumier, l'homme et son œuvre* (Paris, 1890).

DAUN, *doun*, LEOPOLD JOSEPH MARIA, Count von (1705-66). An Austrian field-marshal and commander-in-chief of the Austrian forces during the Seven Years' War. He was born September 24, 1705, in Vienna, and entered early upon his military career as an officer in the regiment of his father. In the Turkish campaigns of 1737-39, and in the War of the Austrian Succession, he found opportunities for distinction and rose rapidly in rank, being made a field-marshal and privy councillor after the Peace of Aix-la-Chapelle. He was the first director of the military academy at Wiener-Neustadt, and introduced many reforms in the organization of the Austrian Army. In 1757 he succeeded to the chief command. He took the field against Frederick the Great in Bohemia, and, after a hard-fought battle at Kolin, forced the King to retire from that country. He and Prince Charles of Lorraine were thoroughly beaten by the King of Prussia at Leuthen on December 5 of the same year. On October 14, 1758, he gained another victory over Frederick at Hochkirch, and, but for the late arrival of the Prince of Baden-Durlach with reinforcements, he would probably have annihilated the Prussian army. Again, on November 25, 1759, at Maxen, he compelled the Prussian General Fink to surrender, with 11,000 men. He won no other important victories, and was defeated by Frederick at Torgau (1760), where he was wounded for the third time upon the field of battle. He was brave and a skillful strategist, but too deliberate in his movements and no match for his alert antagonist. He won victories without following them up, while Frederick, though losing battles, nearly always derived signal advantages from his campaigns. The Peace of Hubertsburg in 1763 closed Daun's active military career. He died in Vienna, February 5, 1766. Consult *Leben und Thaten des Grafen Leopold von Daun* (Frankfurt and Leipzig, 1759-60). See SEVEN YEARS' WAR.

DAUNOU, *dō'nōō'*, PIERRE CLAUDE FRANÇOIS (1761-1840). A French publicist and statesman. He was born at Boulogne-sur-Mer, and entered the Congregation of the Oratory in 1777. In 1792 he became a member of the National Convention for Pas-de-Calais, where he had previously held the position of grand vicar under the bishop of the department. He opposed the execution of Louis XVI., but voted for his deportation until a settlement might be effected; and he also refused to give his support to the law proscribing the Girondists. For these views he was imprisoned, and escaped death only by the downfall of Robespierre. Throughout this critical period he was distinguished for his moderate policy. He belonged to the Council of the Five Hundred and was the first president of that body. In 1801 he became librarian at the Panthéon, and secured for that library the valuable collection of Pius VI., and in 1807 he was appointed the archivist of the Empire. He was editor of the *Journal des Savants* from 1816 until shortly before his death. His works include: *Histoire littéraire de la France*, upon which he was employed for

twenty years, and *Essai historique sur la puissance temporelle des papes* (1810).

DAUPHIN, *da'fīn*; *Fr. pron. dō'fān'* (OF. *dauphin*, *doffin*, *Fr. dauphin*, *Port. dalfin*, from *Lat. delphinus*, dolphin, on account of the three dolphins on their family crest). Formerly the title of the eldest son of the French King. It was originally the appellation of the lords of the province of Dauphiné. The last of these, Humbert II., dying childless (1349), bequeathed his possessions to Charles of Valois, grandson of Philippe VI. of France, on condition that the heir apparent to the throne of France should bear the title of Dauphin of Vienno, and govern the province. Louis XI. conferred on the Dauphin almost sovereign rights; but after his time these were gradually abridged, until Dauphiné was placed under the same laws as the rest of the kingdom, and the title became merely honorary. After the revolution of 1830, it was abolished altogether. Consult Tricaud, *Histoire des dauphins français* (Paris, 1713).

DAUPHINÉ, *dō'fē'nā'*. Formerly a frontier province in the southeast of France, comprising the present departments of Drôme, Isère, and Hautes-Alpes. After the fall of the Roman Empire Dauphiné formed the southernmost part of the Kingdom of Burgundy. It then passed under the dominion of the Franks, and after the dismemberment of the Carolingian monarchy it became a portion of the new Burgundian Kingdom of Arles. It then passed into the possession of the German Emperor in 1032, and remained united with Germany till the middle of the fourteenth century, when it was presented to France by the last of the lords of Dauphiné. Governed for a century as a separate State, by the heir to the French throne, it was finally incorporated with France. During the Civil Wars Dauphiné was the stronghold of Protestantism and the scene of many bloody conflicts, in which the Huguenots gained the upper hand. The old rulers of the land bore the title of Dauphin (q.v.), and the name was afterwards transferred to the district. Consult Chariot, *Histoire générale du Dauphiné* (Valence, 1883).

DAUPHINE, *dō'fēn'*, SIR EUGENE. The none too scrupulous hero of Ben Jonson's *Epicæne*, who marries his uncle to a man disguised as a woman, and thereby secures the inheritance.

DAURAT, *dō'rā'*, or **DORAT**, JEAN, Latin name AURATUS (c.1500-88). A French poet, born and educated at Limoges. He was appointed preceptor of the pages at the Court of Francis I., who took a deep interest in him; became director of the College at Coqueret, and in 1560 was appointed professor of Greek in the Royal College in Paris. He was called the 'modern Pindar,' and ranked among the 'Pleïades,' or seven great poets of the age. He also held the position of 'poet royal' to Charles IX. His numerous odes and epigrams do not, however, justify the high estimation in which he was held in the sixteenth century. They are written in Latin and in 1586 were published under the title, *Pœmatica, hoc est Poematum Epigrammatum, Anagrammatum*.

DAUTZENBERG, *dou'tsen-bērck*, JOHANN MICHAEL (1808-69). A Flemish poet, born at Heerlen, Netherlands. He is known chiefly through his *Folksleesboek* (with Duyse, 1854), his valuable writings on prosody, and his intro-

duction of foreign metres into Dutch poetry, a task in which he succeeded despite the numerous difficulties presented. His valuable poetic works, which include a translation of the *Odes* of Horace, were published at Brussels in 1850, under the title of *Gedichten*. Those written after 1850 were collected by Frans de Cort in the volume entitled *Verspreide en nagelaten gedichten* (2d ed. 1875). Dautzenberg exercised a most favorable influence upon the development of Flemish poetry, and at the same time advocated a closer union with the other branches of Teutonic literature, and more particularly with the German.

DAUW, *dā*. A local name in South Africa for Burchell's zebra, also called by the Dutch there 'bonte quagga,' and by the Bechuanas 'peetis.' See ZEBRA.

DAVALOS, *dā-vā'lōs*, GIL RAMIREZ (c.1505-61). A Spanish soldier, born at Baeza, in Castile. He accompanied Antonio de Mendoza to Peru, and after the revolt of Girón succeeded his brother, Egidio Ramirez Davalos, as Governor of Quijos. He founded Cuenca (1557) and several other towns, which are now abandoned.

DAVENANT, *dāv'e-nant*, Sir WILLIAM (1606-1668). An English poet and playwright. He was born at Oxford, where his father kept the Crown Inn. When only ten years old, the precocious boy composed, on the occasion of Shakespeare's death, an ode to the memory of the great dramatist; and afterwards was accustomed to claim that he was, in fact, Shakespeare's son. In 1682 he began to write for the stage, and ten years after, on the death of Ben Jonson, he was appointed poet laureate. The next year he became manager of the Cockpit, a theatre in Drury Lane; but, entering into the intrigues of the Civil War, he was apprehended. He finally escaped, however, to France, and, returning, distinguished himself so much in the cause of the Royalists that he was knighted by Charles after the battle of Gloucester. Davenant a second time got into difficulties, and was confined in the Tower for two years, when he was released, as is said, on the intercession of Milton. There he continued his epic poem *Gondibert*, begun in France. Once more set free, he set about establishing a theatre. Obtaining at first permission to give dramatic performances at private houses, he reopened the Cockpit in 1658. After the Restoration he was favored by royal patronage, and continued to write and superintend the performance of plays until his death. Davenant was one of the most popular playwrights of his time. Though none of his plays rank high as literature, they seem to have been suitable to the stage. He made some curious adaptations of Shakespeare's plays; for example, of *Measure for Measure*, and, aided by Dryden, of *The Tempest*. He introduced opera on the English stage, and women to play the female rôles. The date of these innovations is 1656. His epic has some interest in that it was written in a stanza afterwards employed by Gray in his famous *Elegy*. Consult Davenant's plays, with memoir, edited by Laing and Maidment (5 vols., Edinburgh, 1872-74).

DAVENPORT. A city and county-seat of Scott County, Ia., on the west bank of the Mississippi River, 330 miles above St. Louis, Mo., and opposite Rock Island, Ill., with which it is

connected by two bridges: an iron railway and carriage bridge, built at a cost of \$1,200,000, and an iron railway bridge, which cost \$800,000 (Map: Iowa, G 3). It is 183 miles west by south of Chicago, and is on the Chicago, Rock Island and Pacific; the Chicago, Milwaukee and Saint Paul; the Chicago, Burlington and Quincy; the Burlington, Cedar Rapids and Northern; and other railroads. River packets from Saint Louis to Saint Paul afford additional transportation facilities. Davenport is situated on the slope of a steep bluff, and commands an extensive view. On Rock Island, which is crossed by the great bridge, are the United States Arsenal and military headquarters, and other Government buildings. The city has a public library, Academy of Natural Sciences, Saint Luke's, Mercy, and other hospitals, numerous public and parochial schools, two opera houses, and many other notable buildings; and is the seat of the Academy of the Immaculate Conception, Saint Ambrose College, Saint Katherine's Hall, and the State Orphan Home. It is an episcopal see of the Protestant Episcopal Church and of the Roman Catholic Church. The city is in a rich agricultural and coal-mining region; it ships large amounts of farm produce, and has extensive manufactures of carriages, farming tools, machinery, lumber, flour, woolen goods, cordage, glucose and its products, pottery, cigars, beer, soap, etc. Founded in 1835 by a company headed by Col. George Davenport, Davenport was incorporated as a town in 1838, and as a city in 1851. The Chicago and Rock Island Railroad was completed in 1854. The government is conducted by a mayor, elected every two years, and a city council, composed of the executive and aldermen, chosen by wards and on a general ticket. The city officials are appointed as follows: By the mayor, all police officers; by the mayor and council, city electrician, library trustees, chief of fire department, and city scavenger; by the council, street commissioner, city engineer, attorney, and sexton; all others are elected by the people. The annual income of the city amounts to about \$540,000; expenditure to \$500,000; the principal items of expense being: Police department, \$24,000; fire department, \$30,000; schools, \$125,000. Population, in 1890, 26,872; in 1900, 35,254.

DAVENPORT, CHARLES BENEDICT (1866-). An American zoölogist, born at Stamford, Conn., June 1, 1866. He graduated at the Brooklyn Polytechnic Institute in 1886, and at Harvard in 1889, taking the degree of Ph.D. at the latter place in 1892. In 1888 he began to teach at Harvard, where he was instructor in zoölogy until 1900. In 1898 he became director of the Marine Biological Laboratory at Cold Spring Harbor, L. I., and in 1900 assistant professor of zoölogy at the University of Chicago. He has written *Observations on Budding in Paludicella and Some Other Bryozoa* (1891); *On Urnatella Gracilis* (1893); *Experimental Morphology* (1897-99); *Statistical Methods, with Special References to Biological Variation* (1899); *Introduction to Zoölogy* (with Gertrude Crotty Davenport, 1900).

DAVENPORT, EDWARD LOOMIS (1816-77). An American actor. He was born in Boston, Mass., and made his first appearance in Providence, R. I., playing a minor part in *Sir Giles*

Overreach, with the elder Booth as Sir Giles. Davenport made rapid progress, and was soon recognized as a leading artist in tragedy, comedy, and melodrama. He supported Mrs. Mowatt (Ritchie) in a wide range of characters, and accompanied her, about 1847, to England, where he also played with Macready and other stars. There, too, in 1849, he married Miss Fanny Vining, an actress, whom he later introduced to the American stage. She died in 1891. Returning in 1854, he traveled over the United States, playing in the principal cities, chiefly in Shakespearian characters and those drawn from Dickens's novels. At different times he was manager of the Howard Athenæum, in Boston, and other theatres. Among his latest conspicuous representations were such widely divergent characters as Brutus in *Julius Cæsar* and Bill Sikes in *Oliver Twist*. His renderings of the part of Sir Giles and of Hamlet were also especially admired. Davenport was highly esteemed for his genial and open-hearted manners. He died at his summer home in Canton, Pa. Consult Edwards, in Matthews and Hutton, *Actors and Actresses of Great Britain and the United States*, vol. iv. (New York, 1886).

DAVENPORT, FANNY LILY GIPSY (1850-98). A well-known American actress, the daughter of Edward Loomis Davenport. She was born in London, England, but was brought to America when a child, and was educated in the Boston public schools. When seven years old she appeared at the Howard Athenæum, in Boston, as the child of *Metamora*, but her real début was at Niblo's Garden in February, 1862, as King of Spain in *Faint Heart Never Won Fair Lady*. This was followed by a season in soubrette parts in the South. While playing at the Arch Street Theatre, Philadelphia, under the management of Mrs. John Drew, she attracted the attention of Augustin Daly, who promptly gave her a place in his Fifth Avenue Theatre in 1869. Afterwards she visited the principal towns and cities of the United States as a star in a wide variety of rôles in both comedy and tragedy. Among her greatest successes were those won in Sardou's *Fedora* (1883), *La Tosca* (1888), and *Cleopatra* (1890). In 1897 she produced *The Soldier of France*, a play with Jeanne d'Arc as the heroine. It was a failure, and the chagrin of that is thought to have hastened her final illness. She appeared on the stage for the last time at the Grand Opera House, Chicago, March 25, 1898. Her death occurred at Duxbury, Mass. She was the wife of Mr. Willet Melbourne MacDowell, her second husband, whom she married in 1889. Consult Benton, in McKay and Wingate, *Famous American Actors of To-day* (New York, 1896).

DAVENPORT, JOHN (1597-1670). An eminent Puritan clergyman, one of the founders of the New Haven Colony in Connecticut. He was born in Coventry, England; studied at Oxford University from 1613 to 1615; acted for about a year as chaplain at Hilton Castle, near Durham; and from 1616 to 1633 was a preacher in London, "where," says Cotton Mather, "his notable accomplishments for a minister and his courageous residence with and visiting of his flock, in a dreadful plague-time (1625), caused much notice to be quickly taken of him." In 1625 he passed the examinations at Oxford for the degrees of B.D. and M.A. He came into conflict

with the ecclesiastical officers, especially with Archbishop Laud on account of his non-conforming tendencies, and in 1633 withdrew from the Established Church and removed to Amsterdam, Holland, whence he returned, however, in 1636, after engaging in a controversy with the Dutch classis on the subject of indiscriminate or promiscuous baptism of infants. In 1637, eluding the authorities, he embarked for Massachusetts, whose charter he had assisted in obtaining in 1629, and in June arrived at Boston, where he remained for nine months, during which time he took a prominent part in the famous Ecclesiastical Synod at Cambridge. He cooperated with Theophilus Eaton (q.v.) in founding the colony of New Haven in April, 1638, and here, as minister and as one of the 'seven pillars' of the civil government, he exercised a powerful influence over both civil and ecclesiastical affairs. In 1661 he concealed the regicides Goffe and Whalley (qq.v.) for more than a month in his own house. He strongly opposed the union of the New Haven and Connecticut colonies, which was effected in 1665, and three years later accepted a call to succeed John Wilson, the original pastor, as pastor of the First Church in Boston, his election to the position causing the secession of part of the congregation, who opposed his views on the 'half-way covenant,' and who, after withdrawing, organized the famous Old South Church. He was one of the editors of the works of the celebrated Dr. John Preston, the leader for some time of the Puritan party in England, and published a number of volumes dealing for the most part with theological subjects, and including: *Discourse About Civil Government in a New Plantation, Whose Design is Religion* (1663); *The Knowledge of Christ Indispensably Required of All Men that Would Be Saved* (1653); *The Power of Congregational Churches Asserted and Vindicated* (1672); *The Saints' Anchor-Hold* (1661); and (with William Hooke) *A Catechisme Containing the Chief Heads of Christian Religion* (1659). Consult: "A Sketch of the Life and Writings of John Davenport," by Dexter, in the *Papers of the New Haven Colony Historical Society*, vol. ii. (New Haven, 1877); and a chapter in Mather, *Magnalia* (London, 1702).

DAVENPORT BROTHERS, THE. The name of two Americans professing to be spiritualistic mediums who flourished between 1845 and 1865. They performed a number of remarkable feats which gained them many followers, but were finally exposed as impostors. See SPIRITUALISM.

DAVID (Heb., beloved). A king of Israel, the youngest son of Jesse, a Judean, dwelling in Bethlehem. His family was one of the principal ones in the town. The number of Jesse's sons is given by later tradition as seven (1. Chron. ii. 13-15), but as eight in Sam. xvii. 12. The chronology of David's reign is very doubtful, but it is certain that the traditional date, B.C. 1055-15, is too early and must be reduced by thirty-five to forty years. The duration of his reign is fixed at forty years (1. Kings ii. 11); but this number, being a round one, is open to suspicion, so that all that can be stated is that his career falls between the last quarter of the eleventh and the first quarter of the tenth century B.C. The biblical account of David is found in (1) 1. Sam. xvi.-1. Kings ii. and (2) in 1. Chron. ii., iii., and

x.-xxix. Of these two sources the first alone can lay claim to historical value. The second, in so far as it is not based on the other (see CHRONICLES), must be used with great caution, and its statements are as a general thing to be discarded as unhistorical or untrustworthy; while the picture that it gives of the King, differing considerably from that found in the books of Samuel, is an idealized David, such as he had become by the third century B.C. in the mind of a pious Jew. Coming to the narrative in Samuel and Kings, great difficulties confront the critic, due largely to the composite character of the historical documents and in part to the corrupt state of the text. The existence of 'doublets,' i.e. two accounts of the same event, in the story of David is believed sufficient to show that in the Book of Samuel different documents have been pieced together. Thus we have two accounts of David's introduction to Saul (I. Sam. xvi. 19-23 and xvii. 1-xviii. 5); of the slaying of Goliath (I. Sam. xvii. 1-xviii. 5 and II. Sam. xxi. 19); of Saul's throwing a spear at David (I. Sam. xviii. 10-11 and xix. 9-10); and more of the same sort. All these doublets, however, are limited to the First Book of Samuel, and from the ninth chapter of the Second Book of Samuel to the end of the twentieth chapter we have a continuous narrative, which is brought to a close in the first two chapters of I. Kings. Chapters xxi. to xxiv. of the Second Book of Samuel again represent an addition of a composite character like the first eight chapters of the First Book of Samuel, and in addition to these we have a number of editorial additions and interpolations, of which the two principal ones are II. Sam. viii. 1-15 and I. Kings ii. 1-12. Of these authorities, the most authentic, according to the critical view, is the long, continuous narrative of the Second Book of Samuel. But even the author of this, while he had trustworthy documents at his disposal, was not a contemporary of David. The date of the other sections is made to vary from a period as old as II. Sam. ix.-xx. down to the days of Josiah (B.C. 639-608). But in even the oldest there is already manifest a tendency to idealize David, which, weak at first, becomes more pronounced as the popular hero recedes into the background of history and becomes a favorite subject for romance, legend, poetical embellishment, and eventually the type of the ideal king and religious poet. In consequence, it is not easy to pick out the genuinely historical incidents in David's career and piece them together into a continuous narrative. Thus the story of David's encounter with the giant Goliath is believed to be a piece of romance (I. Sam. xvii.-xviii.) and the genuine account of Goliath's death to be found in II. Sam. xxi. 19, where we learn that Elhanan was the slayer. Similarly, the stories of David and Jonathan's friendship are romantic, though based on historical facts. On the other hand, there is no reason to question that he acquired musical skill, which, together with his personal charm and the indications that he gave of becoming valorous in war, attracted Saul to him and led to his entering into close relations with the 'melancholy' King. He becomes Saul's armor-bearer, and among the personal services that he renders is to be reckoned his soothing the King by achievements in minstrelsy. His success in the wars against the Philistines increases his

popularity with King and people, and he becomes the son-in-law of the King by marrying Michal.

Soon after, however, a momentous change ensues. Saul, subject to fits of brooding, becomes jealous of David's popularity and entertains suspicion of the latter's fidelity. The story of his actually hurling a javelin at David may be a romantic touch, but it is certain that Saul's jealousy eventually led to David's banishment from the Court. David now becomes a freebooter and gathers a retinue of brave but reckless warriors about him. With them he leads the life of a Bedouin chief, attacking defenseless landowners and hiring his services in attacks upon Amalekites, Philistines, and others. The exact course of his wanderings during this period can no longer be followed. After first trying his fortunes at Nob, he is obliged to seek refuge from Saul at Adullam. We find him next in the wild and desert country south of Judea, and he passes at times as far east as the Dead Sea, but after taking up his abode for a time at Engedi, Saul's pursuit drives him to Gath, where he offers his services to Achish, King of the Philistines, in an expedition against Amalekites, Gezrites, and other desert tribes. In reward for his services he obtains the town of Ziklag as a possession. Achish prepares an attack upon the Israelites and calls upon David to join him. The latter consents, but yielding to the protests of his chief men, who feared treachery on David's part, Achish compels David to depart. Upon reaching Ziklag he finds that the Amalekites had raided the town during his absence. In his pursuit he surprises the Amalekites and routs them. At this moment the tidings reach David of the death of Saul and his three eldest sons at Gilboa in an encounter with the Philistines. The opportunity had now come for David's return to his native country. He secures the favor of the inhabitants of Hebron and the surrounding district and is anointed King in Hebron, while still retaining Ziklag. He makes an attempt at first to obtain control of the northern section, which passes into the hands of Ishbaal, Saul's youngest son, who, however, was entirely in the hands of Abner, the powerful general. Ishbaal foolishly alienates Abner's interest by reproaching him for taking one of Saul's concubines to himself, an act which may have indicated Abner's intention to seize the throne for himself. Abner enters into secret communication with David, but during a visit to him is murdered by Joab, the general of David. Soon afterwards Ishbaal is murdered, and David, being recognized as the natural leader of all Israel, is solemnly anointed King of the whole people at Hebron by an assembly of the elders of the tribes. He is said to have been thirty-seven years old at this time. Seven years, according to the biblical account, had passed since the death of Saul. The accounts of David's reign are quite fragmentary except for occurrences in his immediate family. We learn of successive wars against Moabites, Ammonites, Edomites, and Philistines, and while the accounts of his exploits are portrayed perhaps in too vivid colors, there is no doubt that he succeeded in firmly establishing the independence of Israel and in laying the foundations for future extensions. Among other things, he captures Jebus, which becomes known henceforth under its old name, Jerusalem, makes it the capital of the country, and symbolizes this by removing the

sacred ark to that place. After securing peace from his enemies, David had to quell opposition which arose in his own household. His eldest son Ammon outraged his half-sister Tamar, and in revenge Absalom caused Ammon to be murdered. Subsequently Absalom organized a rebellion against his father, which obliged the King to leave Jerusalem for a time. The uprising is quelled, but not until Absalom has fallen as a victim. Amasa, David's nephew, who had taken part in the rebellion, but had been pardoned by David and promised the chief command in place of Joab, also falls a sacrifice to the latter's jealousy. Once more, as the King stands on the verge of the grave, serious trouble threatens regarding the question of succession. The Court was divided between two candidates—Adonijah, the surviving eldest son, and Solomon, the son of David by Bathsheba. Through the influence of the prophet Nathan, the King decides in favor of Solomon. David dies at an advanced age and is buried in his capital. These family troubles are looked upon by the Jewish writers as a punishment for David's adulterous act with Bathsheba and his subsequent connivance at the murder of Bathsheba's husband, Uriah. There is no doubt that this act, which took place during the war with the Ammonites, is the most serious charge to be brought against him, and there is no reason to question its authenticity, since it is fully in keeping with the conditions that prevailed at the time. In forming an estimate of David, those conditions must be taken into consideration, and no true picture can be obtained of him unless we are willing to recognize his human limitations. That he was a great warrior admits of no doubt. Indeed, he was essentially a soldier, courageous and of boundless energy. He possessed the faculty, moreover, to an extraordinary degree, of gathering men to himself, and as a natural-born leader he overcomes obstacles that would have crushed others. But he also shows traits of cruelty in the treatment of his enemies, connives at treachery, and is willing to make use of underhand measures to accomplish his ends. His moral sense is not strong, and it is probably due to this defect that he shows such lamentable weakness in dealing with his family affairs. But, with all his faults, he remains one of the most notable figures in Hebrew history, and it is not surprising that the attachment to him should have led to the idealization of him by popular tradition, abetted by later writers. Whether he composed poetry is doubtful, though many critics believe that the dirge on the death of Saul and Jonathan (II. Sam. i. 17-27; cf. Psalm xviii.) is his production. In any case, the Psalms, of which seventy-three are by Jewish tradition ascribed to him, do not belong to his age, but reflect in all but a few cases the religious thought and aspirations of post-exilic Judaism. Consult: The Hebrew histories of Ewald, Stade, Wellhausen, Renan, Guthe, Piepenbring, Kittel, Kent, etc.; also Budde, *Die Bücher Richter und Samuel, ihre Quellen und ihr Aufbau* (Giessen, 1890); for David as a tactician, Manel Dieulafoy, *Le Roi David* (Paris, 1897). See PSALMS.

DAVID. (1) A celebrated statue by Michelangelo, representing the youthful Israelitish shepherd, sling in hand. It stands in the Accademia in Florence. The colossal statue was carved by the sculptor when a youth from a great block of marble, which had been cast aside as worthless.

It once stood before the Palazzo Vecchio. (2) A smaller statue, a masterpiece of Donatello, showing David standing over the prostrate Goliath. It is in the National Museum in Florence.

DAVID I. (1084-1153). King of Scotland from 1124 to 1153. He was the youngest son of Malcolm Canmore by his wife Saint Margaret (q.v.). During the fierce struggle for the possession of the Scottish crown, which followed the death of his father in 1093, the youthful David found refuge in England, together with his sister Eadgyth, or Matilda, who, in 1100, married Henry I., King of England. The residence of David at the English Court would appear to have been prolonged for several years, and the assertion of William of Malmesbury may well be credited that "it freed him from the rust of Scottish barbarity." In 1107 his elder brother, Alexander, succeeded to the throne, and David became Prince of Cumbria (q.v.). Together with this great principality he seems to have held lands in Lothian; and by his marriage, in 1113, with Matilda, widow of the Earl of Northampton, he acquired possession of that earldom too. In 1124 he succeeded his brother as King. In 1127 he took an oath, with the other great barons of England, to maintain the rights of his niece, Matilda, as heiress to the English crown, should her father, Henry I., die without male issue. The event thus contemplated came to pass in 1135, and when Stephen mounted the English throne David took up arms in behalf of Matilda. Peace was restored by the grant of the earldom of Huntingdon and the promise of the earldom of Northumberland to David's son, Henry, then in his twentieth year; but the war was soon resumed, and in 1138 the King of the Scots, deserted by Bruce and others of his Anglo-Norman vassals, was signally defeated in the battle of 'the Standard,' near Northallerton. In the next year a second peace was concluded between the two kings, when the promised earldom of Northumberland was bestowed on Prince Henry. In 1140 the Scottish King marched into England for the third time to assert the rights of Matilda. He was again defeated, and only regained his own country with difficulty.

The rest of his reign was devoted to the introduction of English civilization into Scotland, a task which had been begun by his parents and continued by his brothers, King Edgard and King Alexander. He secured the peace and safety of the country by building castles; and by erecting burghs he promoted trade, shipping and manufactures. He showed his favor for learning by endowing many bishoprics and monasteries. David died at Carlisle on May 24, 1153. His son Henry had died in the previous June, and he was succeeded by his grandson, Malcolm. The remains of David's legislation, including the interesting code of the *Leges Burgorum*, have been carefully collected in the first volume of *The Acts of the Parliament of Scotland* (Edinburgh, 1844). Consult Robertson, *Scotland Under Her Early Kings* (Edinburgh, 1862).

DAVID II. See under BRUCE, ROBERT.

DAVID, dâ'vêd', ARMAND (1826—). A French missionary and naturalist, born at Espelette, Basses-Pyrénées. In 1848 he entered the congregation of the Lazarists, and in 1862 went as a missionary to China. Here he made valuable collections of animals, plants, and min-

erals, which he presented to the Museum of Paris. From 1869 to 1871, on behalf of the museum, he made scientific explorations in China and Tibet, discovering many new genera and species of flora and fauna. Subsequently he accomplished a third journey, of which he wrote in the *Journal de mon troisième voyage d'exploration dans l'empire chinois* (2 vols., with maps, 1875). The results of his previous travels are to be found in the *Nouvelles Archives du Muséum d'Histoire Naturelle* (1866, 1868-70). His *Les oiseaux de la Chine* (with 24 plates, 1877) is an important work.

DA'VID, CHRISTIAN (1690-1751). A Moravian missionary, born at Senfleben, December 31, 1690. Brought up a Roman Catholic, he embraced Lutheran views and then Moravian (1717), and founded the Moravian colony of Herrnhut (1722), and was elected the first of the twelve elders. Henceforth he was a missionary in Europe, and even went to Greenland, where he founded the first mission (1747). See **MORAVIANS**.

DAVID, dä'vét, EDWARD. A Flemish buccancer of the latter part of the seventeenth century. He early became one of the 'Brethren of the Coast,' as the West Indian pirates styled themselves, achieved prominence in that organization, and in 1683 sailed as leader of an expedition of three ships for the Pacific. Reinforced by French filibusters with two vessels and a fire-ship, he devastated the coasts of Chile and Peru. A fleet of three galleons and two fire-ships was sent against him by the Viceroy of Peru, but after an indecisive battle he succeeded in making his escape. Subsequently he returned to the coast of Peru, pillaging towns, slaughtering, and exacting ransoms in true piratical fashion. He then transferred his depredations to Central America and Mexico. In 1688, under a general amnesty granted by King James II., he betook himself to England, where he lived for many years in undisturbed possession of his plunder.

DAVID, dá'ved', FÉLICIEN CÉSAR (1810-76). A distinguished French composer. He was born at Cadenet, Vaucluse. At first a chorister and later chapel-master in the cathedral at Aix, he entered at twenty the Paris Conservatory, where he studied with Benoist (organ), Fétis (composition), and Reber (harmony). His uncle cut off his paltry monthly allowance of 50 francs, and David had to give lessons. He joined the Saint-Simonists, but their commune broke up at Ménil-Montant in 1833; with a number of fellow-dreamers he went to the East—Turkey, Egypt, and Syria. After two years of hardship and suffering he returned to France, rich in novel experiences. The fruit of his journeys, *Mémoires orientales*, received scant notice, and David retired for more serious study and composition, but his first symphony (1838) had a like fate. In 1844 his 'symphonic ode,' *Le désert*, was performed at the Conservatory amid tumults of applause, which continued day after day at the successive performances of the work. His next productions, the oratorio *Moïse au Sinaï* (1846), the symphonic ode *Christophe Colomb* (1847), and the mystery *L'Eden* (1848), had little success. But he was now a recognized master; even his earliest compositions found a hearing, and the doors of every theatre were open for his new works, chiefly operas. *La perle du*

Brésil (1851) was received with acclamation, and a national prize of 20,000 francs was awarded (in 1867) to his *Herculanum*, produced at the Grand Opéra in 1859. *Lalla Roukh* (1862) was equally successful, but *Le Saphir* (1865) found less favor. *La captive* was withdrawn by the composer before it was performed. In 1862 he was appointed an officer of the Legion of Honor, and in 1869 elected to succeed Berlioz at the Institute and as a librarian of the Conservatoire de Musique in Paris. His compositions include also chamber music, songs, and pieces for solo instruments. David, the 'musical Orientalist,' occupies a singular position in the history of music: he inaugurated a new movement. During his long years of wandering in the East he absorbed the quaint and weird Oriental melodies, and to express these in the most gorgeous orchestral colors that a rich fancy could think of was his task. It was the easier as Berlioz (q.v.) had already worked out orchestral effects that glowed and blazed, and it remained only to give them an Oriental setting, which David did in *Le désert* and subsequent works. His followers were numerous, and among them the most famous—Bizet (*Djamitch; Les pêcheurs des perles*), Massenet (*Roi de Lahore*), and Délibes (*Lakmé*)—were the most directly influenced. He died at Saint Germain-en-Laye. Consult Azevedo, *Félicien David* (Paris, 1863).

DAVID, FERDINAND (1810-73). A German violinist, born in Hamburg. For two years he was a pupil of Spohr, in Cassel, studying at the same time with Hauptmann. In 1825, when only fifteen years old, he made his first appearance as a violinist at the Gewandhaus in Leipzig. During 1827 and 1828 he played in the orchestra of the Königsstädtisches Theatre, Berlin. At this time he met Mendelssohn, with whom he formed a warm friendship. He left Berlin to become first violin of the private quartet of Baron von Liphardt, of Dorpat, whose daughter he married. During his sojourn in Russia, which continued until 1835, he appeared with great success in Saint Petersburg, Moscow, Riga, and other large cities. In 1836 he was, through Mendelssohn's influence, appointed concertmeister of the famous Gewandhaus Orchestra in Leipzig, a position which he filled ably until his death, near Kloster, Switzerland. In Leipzig he was active as a virtuoso, teacher, editor, and composer. As a virtuoso he had the solid foundations of Spohr's method, combined with the freer development of technique and feeling demanded by more modern taste. His leadership of the violins has left its traditions impressed upon the Gewandhaus Orchestra. Of his success as a teacher it is only necessary to say that Joachim and Wilhelmj were among his pupils. As an editor, he has left *Die hohe Schule des Violinspiels*, a collection of standard works of old masters of the instrument which, together with his own *Method for Violin*, has had much to do with determining the lines along which modern violin-playing has developed. Though he was not a composer of the first rank, his violin concertos are highly esteemed, and his *Bunte Reihe* is a charming series of short pieces for violin with pianoforte accompaniment. When, in 1843, the Leipzig Conservatory of Music was established, David became instructor of violin there. While Mendelssohn was writing his violin concerto he was in constant communication with David, who was the first to play the work,

and to him Mendelssohn presented the MS., which now belongs to David's family.

DAVID, dā'vét, GHEERADT (1450-1523). A Flemish painter, born at Oudewater. Although his name was known to early Flemish writers, it was forgotten in later times until it was discovered by Mr. Weale that a triptych in the Museum of Rouen was painted by him in 1509. He lived chiefly in Bruges, where we find him as a member of the Painters' Guild in 1484, and where most of his works were executed. In 1515 he entered the Painters' Guild of Antwerp. He died at Bruges on August 13, 1523. He was probably a pupil of Memling, to whom his pictures were formerly attributed, and he is the last of the school of the Van Eycks. Among his authenticated works are the "Baptism of Christ," in the Academy of Bruges; the "Virgin and Child, with Saints," an altar-piece in the Rouen Museum; "The Descent from the Cross," a triptych in the Church of Saint Basil in Bruges; and "Christ on the Cross," in the Berlin Museum. His works are noted for their landscapes, which serve as a background, and for their composition. Excellent in this regard are two paintings in the Museum of Bruges representing the "Judgment of Cambyses," painted for the magistracy of that town in 1488. Consult: Crowe and Cavalcaselle, *Early Flemish Painters* (London, 1872); Conway, *Early Flemish Artists* (New York, 1887).

DAVID, dā'véd', JACQUES LOUIS (1748-1825). A French historical painter. He was born in Paris, August 31, 1748. When Boucher was prostituting his art to gratify the depraved tastes of the French populace, David became his pupil; but Boucher, recognizing the broad and noble tendency of David's mind, wisely and honorably transferred him to the influence of Vien. After many struggles, David took the Prix de Rome with his picture, "Antiochus and Stratonice." Arriving at Rome, he found the thoughts of all directed toward antiquity. German minds—that of Winckelmann, for example, and that of Lessing—were also creating enthusiasm for Greek ideals of beauty. This view of art, widely different from that prevailing in France, impressed David, who was copying the classical masterpieces of the Vatican. Its influence upon him was first manifested after his return to Paris, in his picture, the "Plague of Saint Roche," painted in 1780.

More than any other painter of his time, David, with his classical tendencies, represented the spirit of the age—the reaction against the frivolous immorality of monarchical France, and the return to the stern virtues of antiquity. His "Oath of the Horatii" (1784) and "Brutus Condemning His Sons to Death" (1789) were hailed with universal applause. He became the great painter of the Revolution, and presented to the Convention, of which he was a leading spirit, the "Deathbed of Lepelletier," the first martyr of liberty. When Marat was assassinated, he was called by the Assembly to memorialize his death, and he responded with a painting in which the murdered man is portrayed with considerable naturalistic strength. Those of his works which represent what he himself lived and experienced are painted in this manner. The same is true of his portraits of the Revolutionary epoch, like those of Madame Récamier (Louvre), of Barrère,

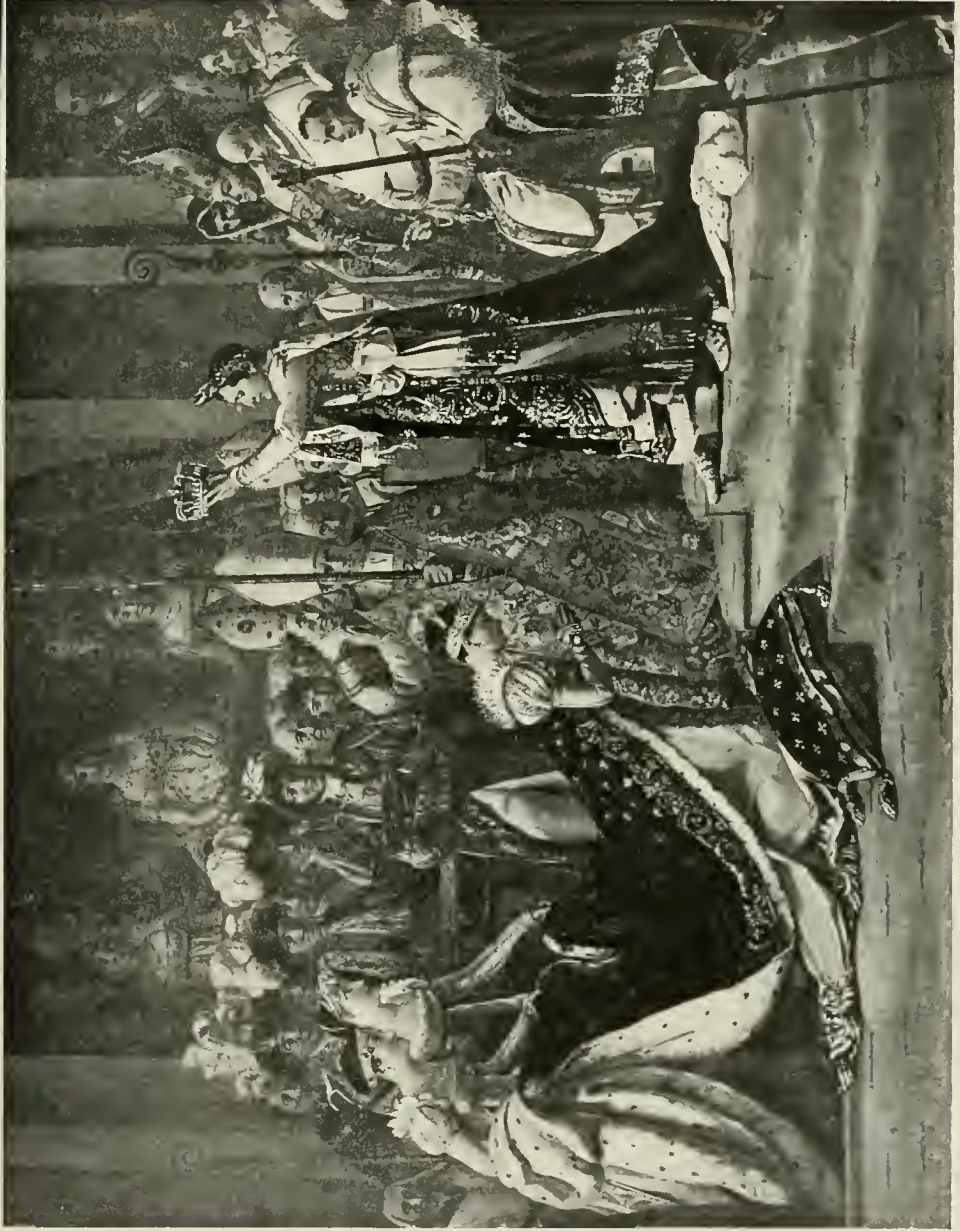
and especially of the young Bonaparte. His chief masterpiece of the Napoleonic period was the colossal picture of the "Coronation of Napoleon I." (finished 1807, and now at Versailles). This is a stately composition, noble in color, and with a tender, quivering light, justifying Muther's encomium of being the best historical painting of the past century. His portraits of this period, as, for example, those of the Emperor, the Pope, and Murat, are all of the highest naturalistic merit. Upon the restoration of the Bourbons, he was exiled to Brussels, where he died on the 29th of December, 1825. During his exile he painted the graceful portrait of the daughter of Joseph Bonaparte, and his "Three Fates," in the Praet collection, Brussels—three hideous old women, painted with keen realism and great pictorial strength, in a manner almost worthy of Frans Hals. All of these works show a realistic talent of the first order, with high powers as a draughtsman and a colorist.

But this is not the only side, or even the best-known side, of David's art. He was at heart an antiquarian, and most of his large canvases represent antique subjects. While these paintings show great excellence of drawing, they are cold in composition and coloring, exaggerated and theatrical in action. Besides those mentioned above, the "Death of Socrates," "Belisarius Asking Alms" (1784), at Lille, "Leonidas at Thermopylæ" (1814), the "Rape of the Sabinæ" (1799), are among the chief of this class of his paintings. These were the works which had the greatest influence upon his pupils. Throughout the Revolution and under the Empire, he was the supreme dictator of art in France, and his influence upon its development was very great. While he resented it from the littleness and trivialities of the followers of Watteau, he established a despotism of classicism which had to be broken before there could be real progress. Nevertheless, he was in a way the regenerator of modern French art, and the accuracy of his drawing exercised a salutary influence upon its development.

Consult: Stranahan, *History of French Painting* (New York, 1899); Muther, *History of Modern Art*, vol. ii. (London, 1896); Delecluze, *J. L. David* (Paris, 1855); Coupin, *Essai sur J. L. David* (Paris, 1827); Normand, "David," in *Les artistes célèbres*.

DAVID, dā'vét, JOHANNES BAPTISTA (1801-66). A Flemish philologist, born at Liege. For more than thirty years he held the chair of Belgian history and Flemish literature at the Catholic University of Louvain. He was one of the greatest Flemish scholars of the century and a very prolific writer. His principal work is the famous *Vaderlandsche historie* (10 vols., 1842-64; 4th ed. 1885 et seq.), a complete history of Belgium. The most important of his linguistic works is entitled: *Eerste beginselen der nederduitsche sprakkunst* (10th ed. 1858).

DAVID, dā'véd', LAURENT OLIVIER (1842—). A Canadian journalist, born at Sault au Recollet, Quebec Province, was educated at the College of Sainte Thérèse, and was called to the bar in 1864. From 1870 to 1884 he was editor of *L'Opinion Publique*; and he has also been at different times connected with *Le Bien Public* and *La Tribune*. He has sat in the Quebec Legislature for Montreal East, and from 1887 to



DAVID
THE CORONATION OF JOSEPHINE, FROM THE PAINTING IN THE LOUVRE, PARIS

1888 was president of the Saint-Jean Baptiste Society of Montreal. His publications include *Biographies et portraits* (1876); *Les héros de Chateauguy* (1883); *Les patriotes de 1837-38* (1884); *Mes contemporains* (1894); *Les deux Papineau* (1896); and *Le clergé canadien: Sa mission et son œuvre* (1896). The last-named work reproves certain Roman Catholics for intervention in political affairs, and was condemned by the Congregation of the Index.

DAVID, PIERRE JEAN (1789-1856). A French sculptor. He was born at Angers, March 12, 1789, and was called David d'Angers to distinguish him from David the painter. He went to Paris to study sculpture. Through the liberality of David the painter, who gave him gratuitous instruction, he was finally enabled to take a prize and to pursue his studies in Rome. He was also a pupil of the sculptor Rolland, and at Rome he frequented the ateliers of Canova and Thorwaldsen. But, notwithstanding this classical training, he copied nature with freedom and fidelity, and belongs to the early naturalists of this century, although not entirely free from classic conventions. He was eminent as a portraitist in sculpture, always producing a work of real art. The ease with which he handled relief is more manifest in his results than in foreshortening, where form is truthfully defined, and yet remains suggestive. The work of David d'Angers is best studied in his own town, and at Père-la-Chaise. He executed many colossal works and numerous busts, but his fame also rests upon his medallions, of which those of Bonaparte and Mme. David are best known. Of his large works, there are the fine groups of the pediment of the Panthéon in Paris, the commission for which was given him by the new Government after the July revolution, during which David had fought in the ranks. In 1848 he was a member of the Constituent Assembly. After the coup d'état by Napoleon III., he was sent into exile, but, after some time spent in Greece, he returned to France. He died January 5, 1856. Among the statues executed by David are "Madame de Staël"; "Talma," for the Théâtre Français; "Cuvier," "Corneille" (Rouen), and "Lafayette" (Washington). Fénélon's monument at Cambrai is also his work, as are busts of Goethe, Schelling, and Dannecker. His two chief works, besides the pediment of the Panthéon, are the tomb of General Gobert (Père-la-Chaise), a very realistic production; and his "Philopœmen" (Louvre) in classic garb. David was a Chevalier of the Legion of Honor, a professor in the Academy of Painters, and a member of the Institute. Consult: Brownell, *History of French Art* (New York, 1892); Gonse, *La sculpture française depuis le XII. siècle* (Paris, 1895); Jouin, *David d'Angers* (Paris, 1878).

DAVID, or DEWI, SAINT (? -601). The patron saint of Wales. He was, according to tradition (probably worthless), the grandson of Ceredig, King of Cardiganshire. He was educated by monks and later went through Wales on a preaching tour. He also founded monasteries, especially that one at Menevia, now called Saint David's, in Pembrokeshire, and there he became abbot, which office was equivalent to bishop and its holder was so designated. As bishop, he presided at the synods of Brei and 'Victory.' He died in 601, and was canonized

in 1120; his festival is held on March 1. He was celebrated for his eloquence and success in conversion. Several works have been ascribed to him, but these are no longer extant. His life was written by Ricemarch, Bishop of Saint David's, who died about the year 1099, reprinted in W. J. Rees, *Lives of the Cambro-British Saints of the Fifth and Immediately Succeeding Centuries*, with an English translation (London, 1853). Consult Rice Rees, *An Essay on the Welsh Saints* (London, 1836).

DAVID AP GWILYM, dā'vəd äp gw'ŵlīm (c.1300-70). The greatest of mediæval Welsh poets. He was born either in Cardiganshire or Glamorganshire. He was a man of considerable education, and his knowledge of Latin and Italian literatures has given rise to the belief that he was educated in Italy. His tendency to satirize his neighbors, as well as his numerous love affairs, brought him into frequent difficulties. He has been compared to Shakespeare, Burns, Ovid, and Petrarch, and addressed to Morvydd, who may be called his Laura, more than 147 poems. Morvydd was the daughter of Madog Iawgain, and her marriage to a wealthy suitor was soon followed by her elopement with the poet. They are said to have escaped to France, but a lawsuit was brought against David by the outraged husband, to whom damages were adjudged in a large sum. Unable to pay it, the poet might have languished in prison had not the people of Glamorgan generously remitted the obligation. In gratitude for this the poet dedicated two of his principal poems to Glamorgan. Two hundred and sixty-two of his poems were edited by Owen Jones (Myfyr) and William Owen-Pughe (London, 1789), and more have been lately discovered in the Mostyn Library and British Museum. An admirable English version of the poems was published by Arthur James Johns (1834). See WELSH LITERATURE.

DAVID CITY. The county-seat of Butler County, Neb., 60 miles west of Omaha; on the Union Pacific, the Burlington and Missouri River, and the Fremont, Elkhorn and Missouri Valley railroads (Map; Nebraska, G 2). It is the centre of an agricultural region. Population, in 1890, 2028; in 1900, 1845.

DAVID COP'PERFIELD. A novel by Dickens, published serially, beginning May, 1849. It was the author's favorite book, and is said to be partly autobiographical. It narrates the life of the hero from his birth to his marriage with the gentle Agnes—the early remarriage of his mother, her death, his miserable school days, his apprenticeship, his running off to the home of an eccentric aunt, Miss Betsy Trotwood, his growth to manhood and happiness in his new surroundings, his first marriage with his 'child-wife,' Dora Spenslow, her death, and his final union with the patient daughter of Mr. Wickfield.

DAVIDEIS. dā-vid'ē-īs. A sacred poem on the troubles of David, the chief work of Cowley, published in 1656, and founded on the life of the second King of Israel.

DAVID GAR'RICK. A comedy by Robertson, which appeared in 1864, and is a translation from the French play *Sullivan*. It purports to represent amatory incidents in the life of the famous eighteenth-century English actor, and

was first produced at the Haymarket with the elder Sothorn in the principal rôle.

DAVIDGE, WILLIAM PLEATER (1814-88). An English comedian, who came to the United States in 1850 and became identified with the American stage. He was born April 17, 1814, in London, and appeared as a youthful amateur at Drury Lane in *The Miller's Maid*. Afterwards he acted in various English cities, especially in Manchester. His first appearance in America was in August, 1850, as Sir Peter Teazle at the old Broadway Theatre, New York; later he supported many well-known actors in the metropolis and elsewhere, among them Edwin Forrest and Fanny Davenport. Some of his notable parts were Caliban; Eccles, in *Caste*; Dick Deadeye, which he created, in *Pinafore*; Old Hardy, in *The Belle's Stratagem*; and Hardecastle, in *She Stoops to Conquer*. His last engagement was with the Madison Square Company, beginning in 1885. He died at Cheyenne, Wyo., August 7, 1888. He was the author of a volume of autobiographical reminiscences, called *Footlight Flashes* (New York, 1866); *The Drama Defended* (New York, 1859); and other works.

His son, **WILLIAM DAVIDGE** (1847-1899), also an actor, was born at Manchester, England, and brought to the United States when a child of three years. During his career he played with William H. Crane (1870-71), Kate Claxton (1877-78), and later for several seasons with Roland Reed. He died in Chicago.

DAVID HAR'UM. A very popular story by Edward Noyes Westcott, which, after rejection by a number of publishers, attained a remarkable success. The character of the shrewd, horse-trading David Harum is distinctively an American type, and was drawn from an original who was a resident of the town of Homer, N. Y. An identification of the characters and scenes has been published by Arthur T. Vance, under the title *The Real David Harum* (New York, 1901).

DA'VIDISTS. The name of two distinct Christian sects: (1) Followers of David of Dinant, a teacher in the University of Paris, whose philosophical work was condemned by the Synod of Paris in 1210, and who, in consequence of the ban laid upon him in 1215 by the Pope, had to flee from France. The place and date of his death are unknown. His fundamental idea was that the Deity alone had any real existence, being the *materia prima* of all things. (2) Davidists, or David Georgians, followers of David George, or Joris, a native of Delft, Holland. In 1530 he was whipped, had his tongue bored, and was imprisoned for obstructing a Roman Catholic procession. He founded a sect of his own, and in 1542 published his *Book of Wonders*, detailing the visions which he professed to have received. After his death his body was dug up and burned by order of the Senate of Basel, where he had passed the latter part of his life as a merchant under an assumed name, John of Bruges. The sect, under the leadership of Henry Nicholas, became known in Holland and England as the 'Familists.' They interpreted the whole of Scripture allegorically, and maintained that as Moses had taught hope and Christ had taught faith, it was their mission to teach love, the service of which was the highest and best of the dispensations. The result was an extreme Antinomianism in practice, which attracted the

notice of the authorities in both countries. Early in the seventeenth century the sect was suppressed or absorbed by others. See JORIS, DAVID.

DAVIDOFF, dä'vê-dôf, KARL (1838-89). A Russian violoncellist, born at Goldingen, Courland. He was educated at the Moscow University, and studied the violoncello under fl. Schmitt in Moscow and Schubert in Saint Petersburg, and harmony with Hauptmann, in Leipzig. He first appeared at the Gewandhaus, Leipzig, in 1859, and was made first violoncellist in the Gewandhaus orchestra, and professor in the Leipzig Conservatory. In 1862 he was appointed solo violoncellist to the Emperor of Russia, and professor in the Conservatory of Saint Petersburg, and was director of the latter from 1876 to 1887. As a virtuoso he was equalled by few, and won great fame on his concert tours through Europe. Besides four concertos, and a number of minor pieces for his instrument, he composed some works for orchestra, pianoforte pieces, and songs.

DAVIDS, THOMAS WILLIAM RHYS (1843—). An English Orientalist. He was born at Colchester, was educated at the University of Breslau, entered the civil service in Ceylon, and filled various judicial appointments in that island. He was called to the bar of the Middle Temple in 1877, and was made professor of Pāli and Buddhist Literature at University College, London, 1882. He has devoted himself especially to the study of Buddhism. His works include: *Buddhism: A Sketch of the Life and Teachings of Gautama, the Buddha* (1877); a translation from the Jātakas, or Buddhist Birth stories; *Buddhism, Its History and Literature* (1896, composed from American lectures). He has also edited many Pāli texts, and is (1902) editor of the Pāli Text Society.

DAVID'S DEER. See ELAPHURE.

DAVIDS ISLAND. An island lying in Long Island Sound, a quarter of a mile north of the city line of Greater New York. It is owned and occupied by the United States Government for military purposes. Its extent is about 100 acres.

DA'VIDSON, ANDREW BRUCE (1840-1902). A Scottish biblical scholar. He was born in Aberdeenshire, and, after receiving an academic education, was ordained in 1863, in which year he was appointed professor of biblical exegesis in the New College, Edinburgh. He is considered an authority on Old Testament exegesis. His publications include a *Commentary on Job* (vol. i., 1862); *An Introductory Hebrew Grammar* (4th ed. 1881); *The Epistle to the Hebrews* (in Clark's Handbooks for Bible Classes, 1882); and *Job and Ezekiel* (in the Cambridge Bible for Schools, 1884).

DAVIDSON, CHARLES (1852—). An American scholar. He was born in Streetsboro, Ohio, and was educated at Iowa College and at Yale University. His publications include: *The Phonology of the Stressed Vowels of Beowulf* (in "Publications of the Modern Language Association," vol. vi., No. 283); *The Difference Between the Scribes of Beowulf* (in "Modern Language Notes," vol. v., No. 2); *English in the Secondary Schools* ("School and College," vol. i., No. 10); and *Studies in the English Mystery Plays*.

DAVIDSON, GEORGE (1825—). An American astronomer. He was born in Nottingham, England, but went to the United States in 1832 and was educated there. He has done notable work on the Government Coast and Geodetic Survey (1845-95), but it is in astronomical research that he gained his greatest distinction. He has traveled on every continent to make observations, particularly of transits of Venus. At present he is professor of geography at the University of California.

DAVIDSON, JAMES WOOD (1829—). An American author, born in Newberry District, S. C. He became professor of Greek in South Carolina College, then principal of the High School at Columbia, and, during the Civil War, adjutant of infantry in Jackson's corps of Lee's army. He was literary editor of the *New York Evening Post* (1873), and American correspondent of the *London Standard* from 1873 to 1878. His published works include *The Living Writers of the South* (1869); *The Correspondent* (1886); *The Poetry of the Future* (1888); and *The Florida of To-day* (1889).

DAVIDSON, JOHN (1857—). An English poet. He was born at Barrhead, near Glasgow, Scotland, April 11, 1857; at the age of thirteen became assistant in the chemical laboratory of a sugar-house at Greenock; attended for a short time Edinburgh University; taught in several Scotch schools; and went to London in 1890, intending to take up a literary career. He had already published three plays—*Bruce* (1886); *Smith: A Tragic Farce* (1888); and *Scaramonsh in Xaros* (1889)—which, though poorly constructed, contain many striking scenes. His later plays have met with considerable success on the stage. In 1901 he began the issue of a series of verse-pamphlets called *Testaments*, of which have appeared "A Vivisector," "A Man Forbid," and "An Empire-Builders." Reactionary from the start, he now utterly repudiates the past in art, literature, morals, and religion. His philosophy (partly derived from Schopenhauer) is thoroughly pessimistic. In man he sees matter striving through brutal effort toward self-knowledge. Hence his defense of vivisection. He is best known by his ballads, individual in subject and style. His thought and manner are well represented by *Making of a Poet*, *Houndsditch*, and the ballads of "Heaven" and "Hell," in *Ballads and Songs* (1894). Other volumes are *Fleet Street Eclogue* (1st ser., 1893; 2d ser., 1895); *New Ballads* (1896); *The Last Ballad and Other Poems* (1898). For critical analysis of his work, consult Archer, *Poets of the Younger Generation* (London and New York, 1902).

DAVIDSON, JOHN WYNN (1824-81). An American soldier. He was born in Fairfax County, Va., graduated at West Point, and was assigned as second lieutenant of dragoons in 1845, and during the Mexican War was with the Army of the West at San Pasqual, the passage of the San Gabriel River, and at Mesa. In 1848 he was promoted to be first lieutenant of the First Dragoons, and from that time until the outbreak of the Civil War was on scouting, garrison, and frontier duty. From 1861 to 1862 he served in the defenses of Washington, D. C., and in the latter year, with rank of major of cavalry, fought in the Army of the Potomac during the Peninsular Campaign, becoming brigadier-gen-

eral of volunteers in 1862. He was brevetted colonel for gallant and meritorious services at the battle of Golding's Farm (Va.), and in 1865 major-general in both the regular and volunteer services for gallantry during the war, and was in command successively of the Saint Louis Division of the Missouri, of the Army of Southeast Missouri, and again of the Saint Louis Division. In 1863 he commanded a cavalry division at Brownsville (Ark.) and Ashley's Mills (Ark.), and in the capture of Bayou Metre (Ark.). He was appointed in 1864 chief of cavalry of the division west of the Mississippi, and in 1866 became lieutenant-colonel of the Tenth United States Cavalry. From 1873 to 1881 he was in command of various posts in the Indian Territory, Texas, and Montana, and in 1879 became colonel of the Second Cavalry.

DAVIDSON, LUCRETIA MARIA (1808-25). An American poet, remarkable for her precocity in rhyming. The first of her writings preserved were done when she was nine years old. At sixteen she attended Mrs. Emma Willard's school at Troy, but her health failed and she died the next year. Many of her pieces were lost or destroyed, but nearly 300 were collected and published by S. F. B. Morse under the title *Amir Khan and Other Poems* (1829). Her sister, MARGARET MILLER DAVIDSON (1823-38), was also a precocious writer, and at the age of ten composed a drama called the *Tragedy of Aethia*. Washington Irving was her patron and supervised the publication of the two sisters' works (1850).

DAVIDSON, SAMUEL (1806-98). An Irish biblical critic. He was born at Kellswater and was educated at the Royal College of Belfast. He entered the Presbyterian ministry, and in 1835 was given the chair of biblical criticism in the Royal College of Belfast. Soon afterwards he became a Congregationalist. In 1842 he was offered the chair of biblical literature and Oriental languages in the Lancashire Independent College at Manchester and was one of the Old Testament Revision committee. His principal works are *Sacred Hermeneutics* (1843); *Text of the Old Testament Considered, with a Treatise on Sacred Interpretation* (1856), written for Horne's *Introduction*. The publication of this discussion resulted in his resignation of his chair at the Manchester College. His other publications include *The Canon of the Bible* (1877); *The Doctrine of Last Things Contained in the New Testament* (1882).

DAVIDSON, THOMAS (1817-85). An English geologist and paleontologist, born in Edinburgh. He studied on the Continent and at Edinburgh University, made extensive geological tours, and at the suggestion of Leopold von Buch, the German geologist, undertook the study of the Brachiopoda. In 1851-70 he published, under the direction of the Palaeontographical Society, his important monograph on *British Brachiopoda* (3 vols.), containing 250 plates drawn by himself. To this work he added (1873-1885) three supplementary volumes. His *Memoir on Recent Brachiopoda* was posthumously published by the Linnean Society. In 1852 he was elected fellow of the Geological Society of London, and in 1857 fellow of the Royal Society. His splendid collection of recent and fossil brachiopods, together with his books, he presented to the National Museum at South Kensington.

DAVIDSON, THOMAS (1840-1900). A Scotch-American philosopher, born near Tetterangus, Scotland. He graduated in 1860 at the University of Aberdeen, removed in 1866 to Canada, and in 1867 to the United States, and in 1875 settled at Cambridge, Mass., where he was active as scholar, author, and lecturer. A close student of Thomas Aquinas, he was invited by the Pope to assist the corps of Italian professors in the preparation of a new edition of the works of that philosopher. His *Philosophical System of Antonio Rosmini-Serbati* (1882) was the first introduction of the latter to English readers. For many years he conducted at Keene, in the Adirondacks, a 'summer school for culture sciences,' and from 1898 a class of Russian Jews in New York City. His personality was large and commanding. His published works include further: a translation of the fragments of Parmenides (1869) and one of Bleek's *Origin of Language* (1869); *A Short Account of the Niobe Group* (1874); *The Parthenon Frieze and Other Essays* (1882); *The Place of Art in Education* (1886); *Aristotle and Educational Ideals* and *A History of Education* (1900).

DAVIDSON, WILLIAM (1746-81). An American soldier. He was born in Lancaster County, Pa., was taken when a child to North Carolina, and became a major in one of the first regiments raised in that State for the Revolutionary War. He was in the engagements at Brandywine, Germantown, and Mounmouth, and advanced to the rank of a brigadier-general of North Carolina militia. In the attempt to check the advance of Cornwallis over the Catawba River at Cowan's Ford, February 1, 1781, he was killed. Davidson College, N. C., was named in his honor.

DAVIDSON COLLEGE. A town in Mecklenburg County, N. C., 22 miles north of Charlotte; on the Southern Railway (Map: North Carolina, B 2). It has cotton-mills, a cottonseed-oil mill, planing-mills, and a flouring-mill. The town is the seat of Davidson College (q.v.) and of the North Carolina Medical College, established about 1890, connected with which is Altheon Hospital. Population, in 1890, 481; in 1900, 904.

DAVIDSON COLLEGE. An institution of higher education established in 1837 at Davidson College, N. C. The college was founded by members of the Presbyterian Church, and is at present governed by a board of trustees appointed by the Presbyterians of North Carolina, South Carolina, Georgia, and Florida (Presbyterian Church South). No theological department, however, is maintained and the degrees conferred are the academic ones in art and science. The student attendance approximates 200; the endowment of the college is \$125,000, the income about \$20,000, and the total value of the college property \$325,000. The library contains 15,000 volumes.

DAVID THE PHILOSOPHER (Arm. *David 'Imasdaser*), or **DAVID THE ARMENIAN**. An Armenian scholar of the fifth century A.D. He studied in Greece, and wrote learned translations of, and commentaries on, the works of Aristotle. Consult: Neumann, *Mémoire sur la vie et les ouvrages de David* (Paris, 1829).

DA'VIE, WILLIAM RICHARDSON (1756-1820). An American soldier, born in Egremont, England. He came to the United States in 1763,

graduated at Princeton in 1776, studied law at Salisbury, N. C., and in 1779 received the commission of a lieutenant of dragoons. His troop was subsequently assigned to Count Pulaski's legion, in which he rose to the rank of major. He resumed the study of law at Salisbury, and in 1779 was admitted to the bar of North Carolina. Under the authorization of that State in 1780 he raised at his own expense a troop of dragoons and two mounted infantry companies, with which to assist in the defense of the southwestern districts against British attacks from South Carolina. In 1780 he was promoted to the command of the State cavalry, with the rank of colonel. At the entry of Lord Cornwallis into Charlotte, N. C., he distinguished himself by his spirited resistance to the repeated charges of Tarleton's famous legion. He was appointed in 1781 to the post of commissary-general of the American Army in the South. After the Revolution he became a successful lawyer, was a delegate to the Constitutional Convention of 1787, and for a number of years represented the borough of Halifax in the Lower House of the State Legislature. He drew up the act, passed in 1789, for the establishment of the University of North Carolina; in 1794 was commissioned major-general of militia; in 1798 was elected Governor of North Carolina; and in 1799 resigned that post to accept appointment to the embassy which concluded with the French Government the convention of September 30, 1800. Consult the biography by Hubbard, in vol. xxv. (Boston, 1848) of *The Library of American Biography*, edited by Jared Sparks.

DA'VIES, BEN (1858—). An English tenor, born in Swansea, Wales. He studied under Randegger at the Royal Academy of Music (1880-83), where he won numerous prizes. Upon leaving the Academy he joined the Carl Rosa Opera Troupe, appearing in *Faust*, *The Bohemian Girl*, etc.; but he is best known as a concert and oratorio singer. He visited the United States in 1893, and again in 1894.

DAVIES, CHARLES (1798-1876). An American mathematician, born in Washington, Conn. He early removed to Saint Lawrence County, N. Y., and in 1815 graduated at West Point. In 1848 he took the chair of mathematics and natural philosophy in the University of New York, and in 1857 the chair of higher mathematics in Columbia College. His works include: *Surveying* (1832); *Trigonometry* (1840); *Logic of Mathematics* (1850); and *Dictionary and Cyclopædia of Mathematical Science* (1855). He edited, in English, Bourdon's *Algebra* (1834), and Legendre's *Geometry* (1828).

DAVIES, HENRY EUGENE, JR. (1836-94). An American soldier, born in New York. He was educated at Harvard, Williams, and Columbia, and was admitted to the bar in 1857. At the outbreak of the Civil War he entered the United States Volunteers as captain, and became brigadier-general in September, 1863. He served with distinction in the Cavalry Corps, Army of the Potomac, became one of Sheridan's most trusted lieutenants, and by 1865 had risen to the rank of major-general of volunteers. He resigned in 1866, and afterwards became a prominent New York lawyer and held several public offices. He was the author of *General Sheridan* (1895), in the Great Commander Series.

DAVIES, JOHN, OF HEREFORD (c.1565-1618). An English poet, not to be confounded with Sir John Davies (q.v.). At Oxford and elsewhere he was famous as a writing-master. He wrote many curious philosophical poems, epigrams, satires, and sonnets. Among these are: *Microcosmos* (1603); *Triumph of Death* (1605), descriptive of the plague; *Wit's Pilgrimage* (c.1610), containing sonnets, etc.; *The Scourge of Folly* (c.1611), containing epigrams, etc., one of which is addressed to Shakespeare under the name 'our English Terence'; and *The Muse's Sacrifice, or Divine Meditations* (1612). Consult *Complete Works*, edited by Grosart (2 vols., Blackburn, 1873).

DAVIES, Sir JOHN (1569-1626). An English poet and statesman. He was born at Tisbury, Wiltshire, educated at Oxford, studied law in the Middle Temple, and was called to the bar in 1595. In 1603 he was sent by James I. as Solicitor-General to Ireland. Three years later he became Attorney-General, and was raised to the degree of sergeant-at-law. Elected to the Irish Parliament in 1613, he was chosen Speaker of the Lower House. The next year he took his seat in the English Parliament as member for Newcastle-under-Lyme. He died just after being nominated Chief Justice. Davies was a faithful public servant, and a man of great talent and learning. His two works connected with his Irish career are *A Discovery of the True Causes why Ireland was Never Subdued, etc.* (1612) and *Reports of Cases Adjudged in the King's Courts in Ireland* (1615), and several masterly State papers. As a poet he belonged to a group of late Elizabethans who, in reaction from the earlier love poetry, turned to moral themes. In 1596 he published *Orchestra, or a Poem of Dancing*, in which he fancifully maintains that all motion is music; to him the heavens move in "spondees, solemn, grave, and low." Still more fanciful are his acrostics, called *Hymns to Astræa* (1599). The poem by which he is best known is *Nosce Teipsum* (1599), in which is discussed the nature of the soul and immortality. It is written in the four-line stanza, afterwards employed by Davenant, Dryden, and Gray. Consult *Complete Works*, with memoir edited by Grosart (3 vols., Blackburn, 1869-76).

DAVIES, LOUIS HENRY (1845-). A Canadian statesman. He was born at Charlottetown, Prince Edward's Island, was educated at Prince of Wales College, Charlottetown, and in 1866 was called to the bar. In 1876 he became Premier and Attorney-General of Prince Edward Island, and in 1882 was returned as a Liberal to the Dominion Parliament, in which he has since continued to hold his seat. He was appointed as one of the British counsel before the International Fisheries Commission at Halifax in 1877.

DAVIES, SAMUEL (1724-61). An American clergyman and educator. He was born near Summit Ridge, Newcastle County, Del.; was educated at the seminary of the Rev. Samuel Blair, Fogg's Manor, Chester County, Pa., and in 1746 was licensed to preach by the Newcastle Presbytery. In 1747 he was sent as an evangelist to Hanover County, Va., where by 1748 he was conducting worship in seven churches near Hanover. He later argued against Peyton Randolph, the Royal Attorney-General, before the General

Court at Williamsburg, in defense of the proposition that the Act of Toleration extended to the Colony of Virginia. In this view he found himself supported by the King. In 1753, with Gilbert Tennent, he visited England to obtain funds for the College of New Jersey (now Princeton University). His sermon, "Religion and Patriotism," preached to Captain Overton's company of volunteers in Hanover County, 1755, refers to the martial spirit aroused by the French and Indian War, and he adds in a footnote: "As a remarkable instance of this, I may point out to the public that heroic youth, Colonel Washington, whom I cannot but hope Providence has hitherto preserved in so signal a manner for some important service to his country." In 1759 he succeeded Jonathan Edwards as president of the College of New Jersey. His collected sermons appeared in London in 1767. The New York edition of 1851 (3 vols.) contains a memoir by Albert Barnes.

DAVIES, THOMAS (c.1712-85). A Scotch bookseller and author. He studied at the University of Edinburgh, made an unsuccessful attempt at acting, and, having been roundly ridiculed by Churchill in *The Rosciad*, set up a bookshop in Covent Garden. It was here that, in 1763, he introduced Boswell to Dr. Johnson, who was his very good friend, and to whom he dedicated his edition of the works of Massinger. He wrote a *Life of Garrick* (1780), which soon passed through four editions, and brought him considerable money and repute.

DAVIESS, dā'vīs, JOSEPH HAMILTON (1774-1811). An American lawyer. He was born in Bedford County, Va.; was taken to Kentucky by his parents when a child, was educated there, and soon became well known in the West for his eccentricities as well as for his skill as a lawyer. He was United States district attorney for Kentucky, and as such attempted to bring Aaron Burr (q.v.) to trial for treason (1806), but was unsuccessful, and gained only personal unpopularity. Having entered the army, he fought as major under Gen. W. H. Harrison at Tippecanoe, where he was killed while leading a brilliant cavalry charge against the savages. Daviess married a sister of John Marshall.

DÁVILA, dā'vê-lá, or DE ÁVILA, ALONZO (c.1540-66). A Spanish soldier, born in the City of Mexico. In 1566 he was accused of complicity in a plot to overturn the Government and place Martín Cortés on the throne of New Spain. He was subsequently condemned and executed at Mexico. That he had any share in the plot, if such there were, is now considered extremely doubtful.

DAVILA, ENRICO CATERINO (1576-1631). An Italian historian, born at Sacco, near Padua. His father was the constable of Cyprus, and after the Turkish victories was obliged to take refuge in France, where Enrico was brought up as page to Henry III. Afterwards he fought in the French Army, distinguished himself at Honfleur (1594) and Amiens (1597), and was killed while in the service of Venice (1631). His history gives an authentic account of the years from 1559 to 1598, although he was always a partisan of Catherine de' Medici. The title is *Historia delle guerre civili di Francia nella quale si contengono le operazioni di quattro re Francesco II., Carlo IX., Henrico III., et Henrico*

IV., *cognominato Grande* (1630); the work has gone through two hundred editions; the best is that published in Paris (1644). It has been translated into nearly all the modern languages, and into Latin by Cornazzano (1745).

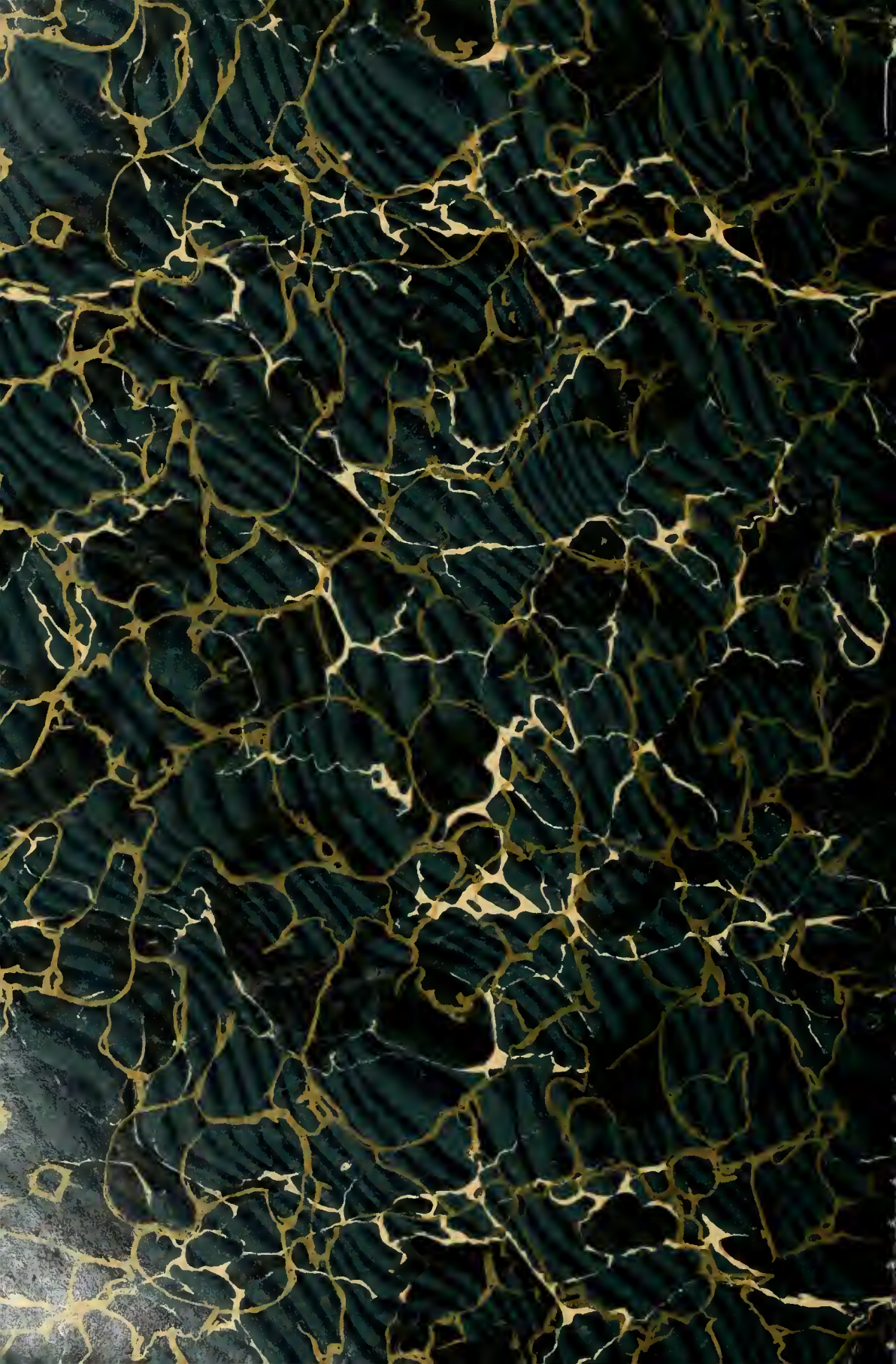
DÁVILA, GIL GONZALES (1570-1658). A Spanish historiographer, born at Avila. He held a minor ecclesiastical office at Salamanca, and was appointed royal chronicler of Castile and the Indies. His *Teatro eclesiástico de la primitiva iglesia de las Indias Occidentales* (1640-55) holds a high place as a general Church history of New Spain.

DÁVILA Y PADILLA, dá'vê-lá ê pâ-pê'lyá, AGUSTIN (1562-1604). A Mexican historian. He was born in the City of Mexico, where he entered the Dominican Order in 1579. He was friar of the Convent Puebla de los Angeles in Thascala, and lecturer on philosophy and theology at the colleges of Puebla and Mexico. He was one of the chief officers of the highest chapter

in his province, and in 1596 was sent as ambassador of the Order to Rome and Madrid, where two years later he became Court preacher. As a prominent officer of the Inquisition he caused to be burned several hundred copies of a Spanish translation of the Bible which had been supplied with annotations by Protestants. He was one of the most zealous members of his Order, and also one of the most learned and eloquent, for which reason the title 'Chronicler of the Indies' was bestowed upon him. His principal work, written by order of the Government, was published under the respective titles: *Historia de la fundación de la provincia de Santiago de Méjico, de la orden de predicadores* (1596; 2d ed. 1625) and *Varia Historia de la Nueva España y Florida* (2d ed. 1634).

DAVIN, dá'văn', FÉLIX. The nom-de-plume signed to the introduction of the *Etudes psychologiques* by Honoré de Balzac.

DA VINCI, dá-vên'chê, LEONARDO. See VINCI, LEONARDO DA.



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